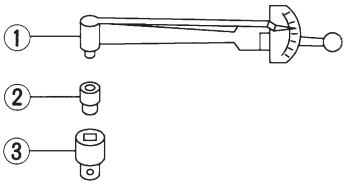
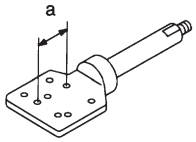
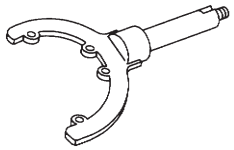
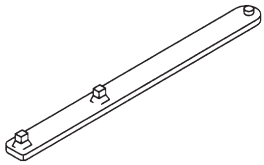
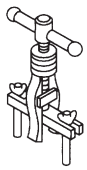
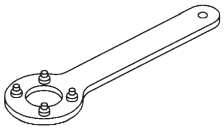
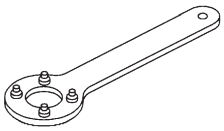
PROPELLER SHAFT & DIFFERENTIAL CARRIER

SECTION PD

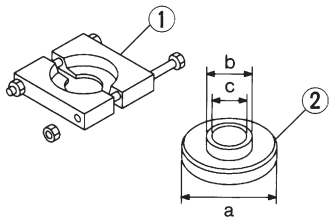
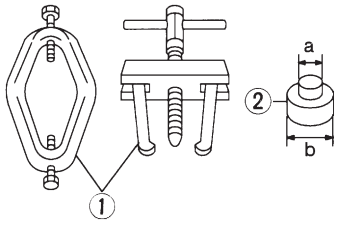
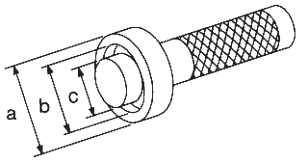
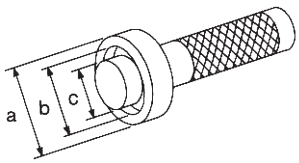
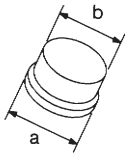
CONTENTS

H233B

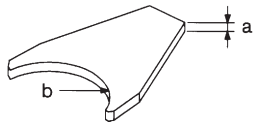
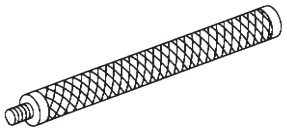
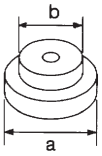
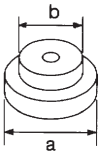
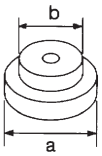
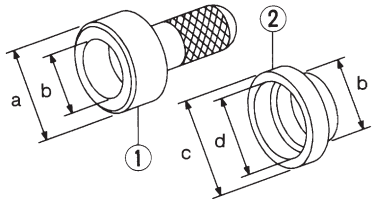
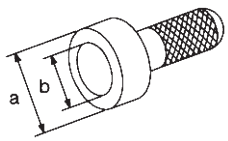
Special Service Tools

Tool number Tool name	Description		Unit application		
			R180A	C200	H233B
ST3127S000 Preload gauge ① GG91030000 Torque wrench ② HT62940000 Socket adapter ③ HT62900000 Socket adapter	 NT124	Measuring pinion bearing preload and total preload	X	X	X
KV38100800 Differential attachment	 NT119	Mounting final drive (To use, make a new hole.) **a: 152 mm (5.98 in)**	X	—	—
ST06340000 Differential attachment	 NT140	Mounting final drive	—	—	X
ST32580000 Differential side bearing adjusting nut wrench	 NT141	Adjusting side bearing preload and backlash (ring gear-drive pinion)	—	—	X
ST33290001 Side bearing outer race puller	 NT076	Removing side bearing outer race and side oil seal	X	—	—
ST38060002 Drive pinion flange wrench	 NT113	Removing and installing propeller shaft lock nut and drive pinion lock nut	X	X	—
KV38104700 Drive pinion flange wrench	 NT113	Removing and installing propeller shaft lock nut, and drive pinion lock nut	—	—	X

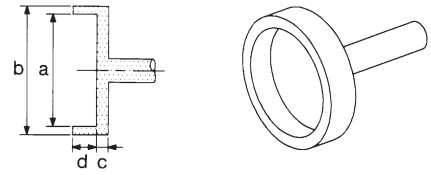
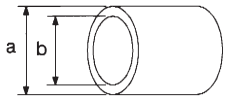
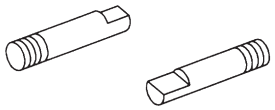
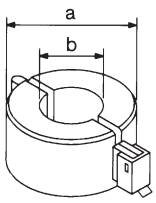
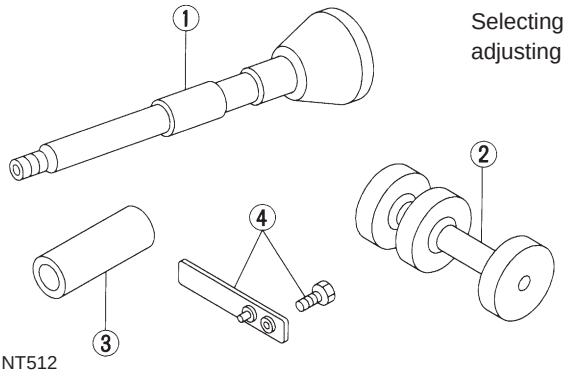
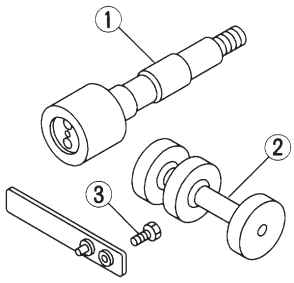
Special Service Tools (Cont'd)

Tool number Tool name	Description		Unit application		
			R180A	C200	H233B
ST3090S000 Drive pinion rear inner race puller set ① ST30031000 Puller ② ST30901000 Base	 NT527	Removing and installing drive pinion rear inner cone (All) Removing rear wheel sensor rotor (C200) **a: 79 mm (3.11 in) dia.** **b: 45 mm (1.77 in) dia.** **c: 35 mm (1.38 in) dia.**	X	X	X
ST3306S001 Differential side bearing puller set ① ST33051001 Body ② ST33061000 Adapter	 NT072	Removing and installing differential side bearing inner cone (All) Removing rear wheel sensor rotor (C200) **a: 28.5 mm (1.122 in) dia.** **b: 38 mm (1.50 in) dia.**	X	X	X
ST33230000 Differential side bearing drift	 NT085	Installing side bearing inner cone **a: 51 mm (2.01 in) dia.** **b: 41 mm (1.61 in) dia.** **c: 28.5 mm (1.122 in) dia.**	X	X	—
ST33190000 Differential side bearing drift	 NT085	Installing side bearing inner cone **a: 52 mm (2.05 in) dia.** **b: 45.5 mm (1.791 in) dia.** **c: 34 mm (1.34 in) dia.**	—	—	X
ST33081000 Side bearing puller adapter	 NT431	Installing side bearing inner cone **a: 43 mm (1.69 in) dia.** **b: 33.5 mm (1.319 in) dia.**	—	X	X

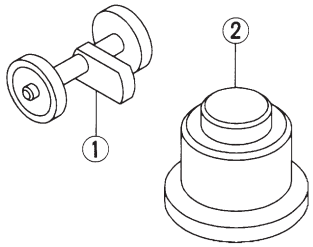
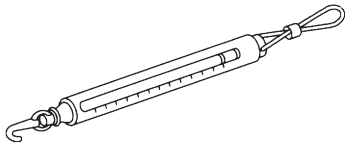
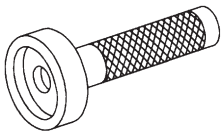
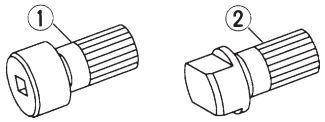
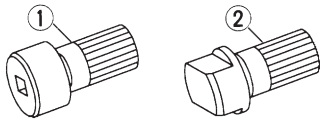
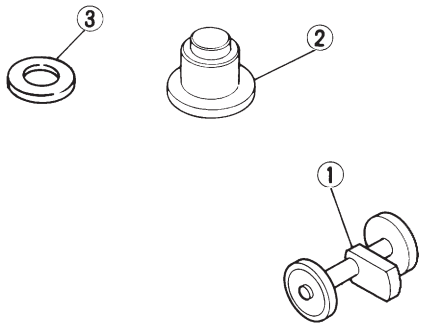
Special Service Tools (Cont'd)

Tool number Tool name	Description		Unit application		
			R180A	C200	H233B
KV38100600 Side bearing spacer drift	 NT528	Installing side bearing spacer **a: 8 mm (0.31 in)** **b: R42.5 mm (1.673 in)**	—	X	—
ST30611000 Drift	 NT090	Installing pinion rear bearing outer race	X	X	X
ST30621000 Drift	 NT073	Installing pinion rear bearing outer race **a: 79 mm (3.11 in) dia.** **b: 59 mm (2.32 in) dia.**	X	X	X
ST30701000 Drift	 NT073	Installing pinion front bearing outer race **a: 61.5 mm (2.421 in) dia.** **b: 41 mm (1.61 in) dia.**	X	—	—
ST30613000 Drift	 NT073	Installing pinion front bearing outer race **a: 72 mm (2.83 in) dia.** **b: 48 mm (1.89 in) dia.**	—	X	X
KV381025S0 Oil seal fitting tool ① ST30720000 Drift bar ② KV38102510 Drift	 NT525	Installing front oil seal (R180A, H233B) Installing rear wheel sensor rotor (C200) **a: 77 mm (3.03 in) dia.** **b: 55 mm (2.17 in) dia.** **c: 71 mm (2.80 in) dia.** **d: 65 mm (2.56 in) dia.**	X	X	X
KV38100500 Gear carrier oil seal drift	 NT115	Installing front oil seal **a: 85 mm (3.35 in) dia.** **b: 60 mm (2.36 in) dia.**	X	X	—

Special Service Tools (Cont'd)

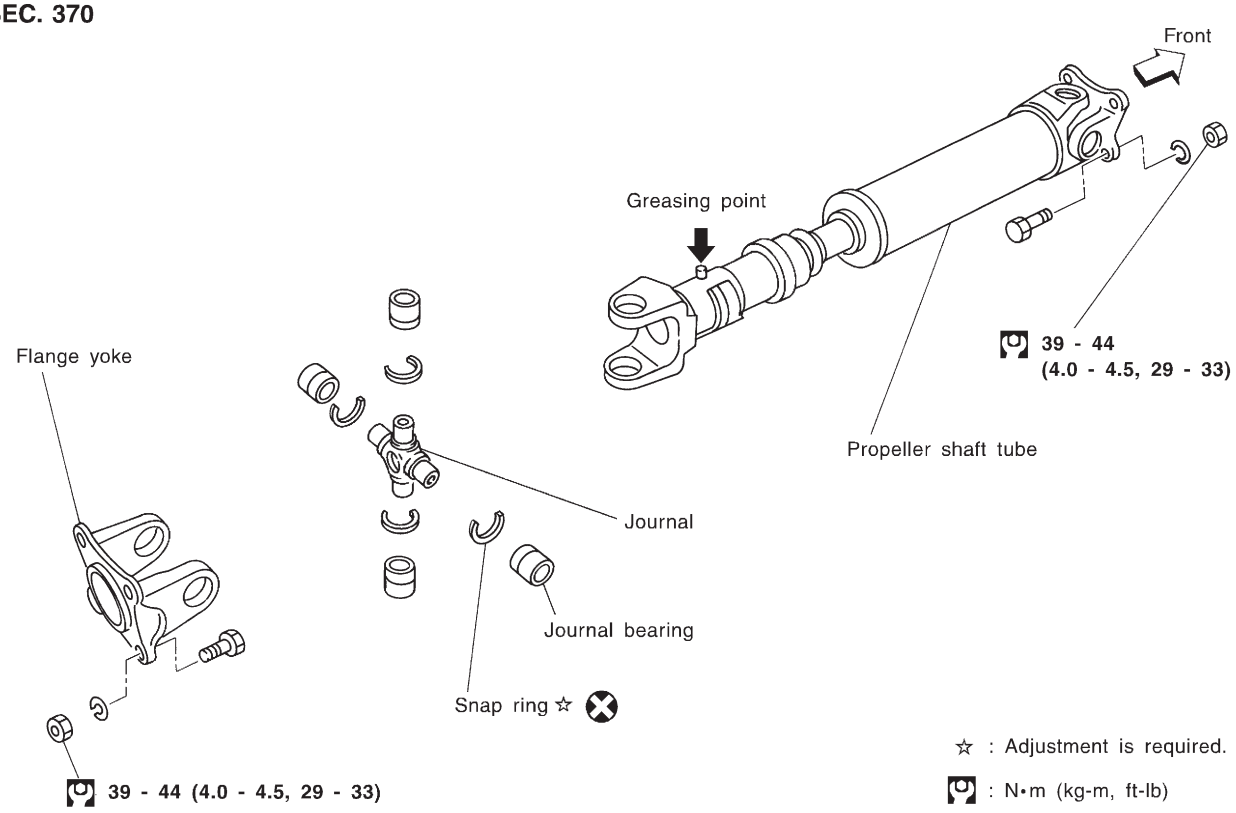
Tool number Tool name	Description		Unit application		
			R180A	C200	H233B
ST15310000 Drift	 NT607	Installing front oil seal **a: 84 mm (3.31 in) dia.** **b: 96 mm (3.78 in) dia.** **c: 8 mm (0.31 in)** **d: 20 mm (0.79 in)**	—	—	X
KV40104710 Drift	 NT474	Installing front oil seal **a: 76.3 mm (3.004 in) dia.** **b: 67.9 mm (2.673 in) dia.**	—	—	X
ST33720000 Differential side retainer guide	 NT138	Installing side retainer	X	—	—
ST33270000 Side oil seal drift	 NT526	Installing side oil seal **a: 62 mm (2.44 in) dia.** **b: 28 mm (1.10 in) dia.**	X	—	—
KV381001S0 Drive pinion height setting gauge set ① KV38100110 Dummy shaft ② KV38100120 Height gauge ③ KV38100130 Collar ④ KV38100140 Stopper	 NT512	Selecting pinion height adjusting washer	X	—	—
KV381039S0 Drive pinion setting gauge ① KV38103910 Dummy shaft ② KV38100120 Height gauge ③ KV38100140 Stopper	 NT226	Selecting pinion height adjusting washer	—	X	—

Special Service Tools (Cont'd)

Tool number Tool name	Description		Unit application		
			R180A	C200	H233B
ST3125S000 Drive pinion height setting gauge set ① ST31251000 Height gauge ② ST31181001 Dummy shaft	 NT524	Selecting pinion height adjusting washer	—	—	X
Spring gauge	 NT127	Measuring carrier turning torque	X	X	X
Gear carrier side oil seal drift	 NT120	Installing side oil seal	X	—	—
KV381051S0 Rear axle shaft dummy ① KV38105110 Torque wrench side ② KV38105120 Vice side	 NT142	Checking differential torque on limited slip differential	—	X	—
KV381052S0 Rear axle shaft dummy ① KV38105210 Torque wrench side ② KV38105220 Vice side	 NT142	Checking differential torque on limited slip differential	—	—	X
ST3125S001 Drive pinion setting gauge set ① ST3131251000 Height Gauge ② ST31181001 Dummy Shaft ③ KV38108700 Spacer [thickness: 2.00 mm (0.0787 in)]			—	—	X

Front propeller shaft (Model 2F71H)

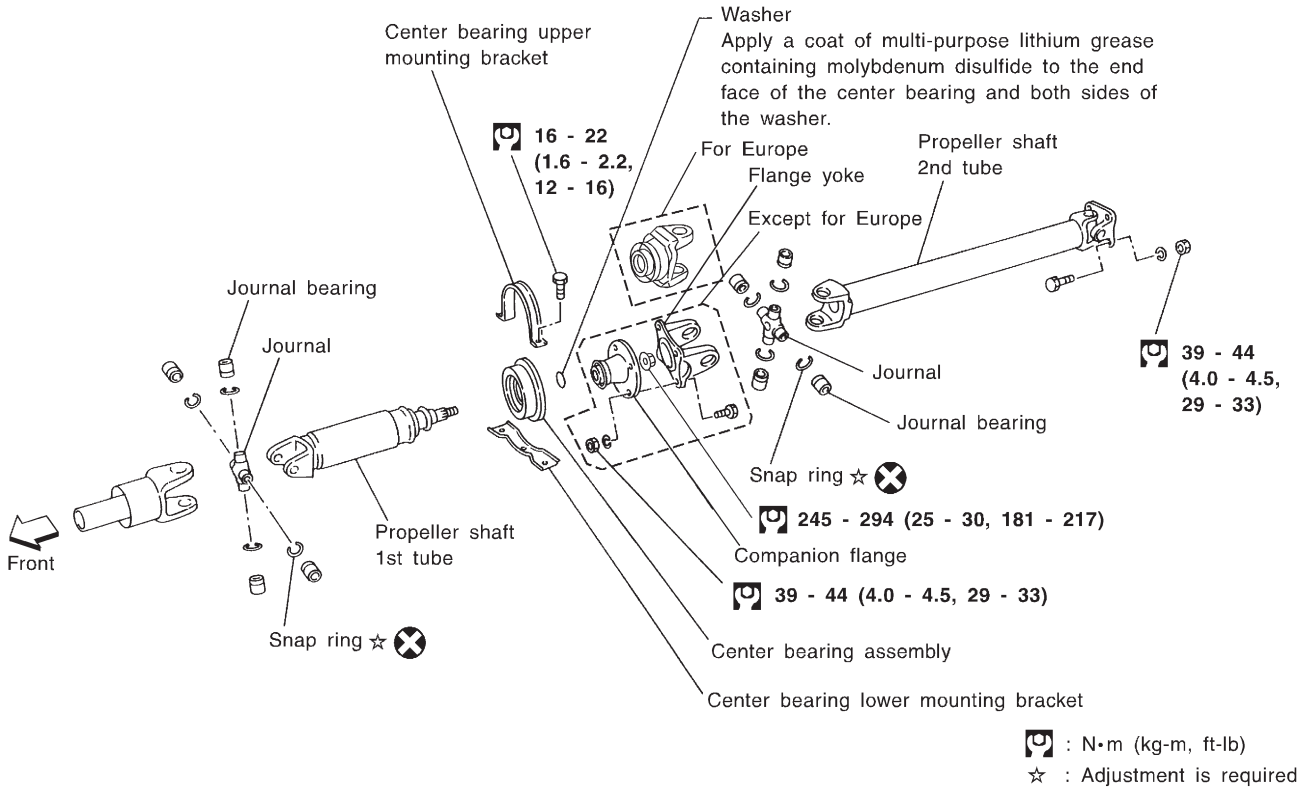
SEC. 370



SPD459A

Rear propeller shaft (2WD models)

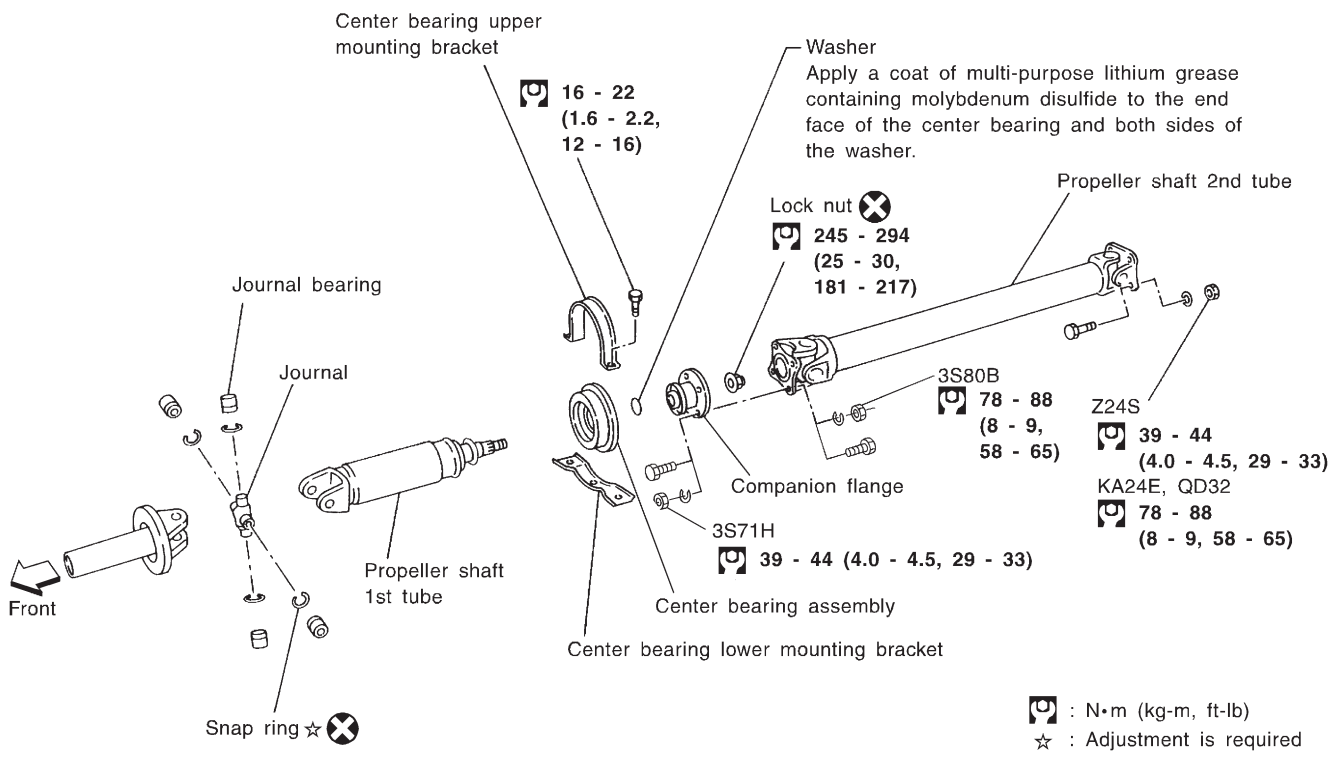
SEC. 370

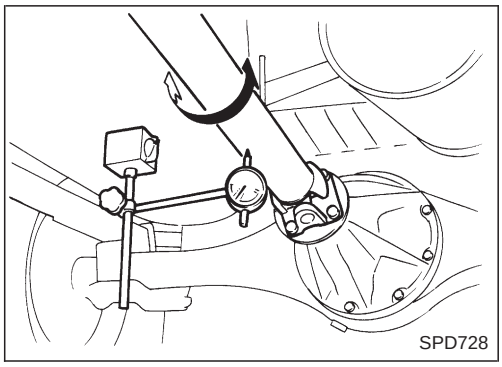


SPD460A

Rear propeller shaft (4WD models)

SEC. 370




SPD728

On-vehicle Service

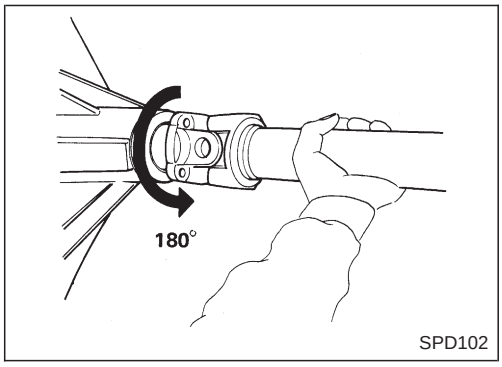
PROPELLER SHAFT VIBRATION

If vibration is present at high speed, inspect propeller shaft runout first.

1. Raise rear end of vehicle until wheels are clear of the ground.
2. Measure propeller shaft runout at several points along propeller shaft by rotating final drive companion flange using hands.
3. If runout exceeds specifications, disconnect propeller shaft at final drive companion flange. Rotate companion flange 180 degrees, then reconnect propeller shaft.
   Runout limit: 0.6 mm (0.024 in)
4. Check runout again. If runout still exceeds the limit, replace propeller shaft assembly.
5. Perform road test.

APPEARANCE CHECKING

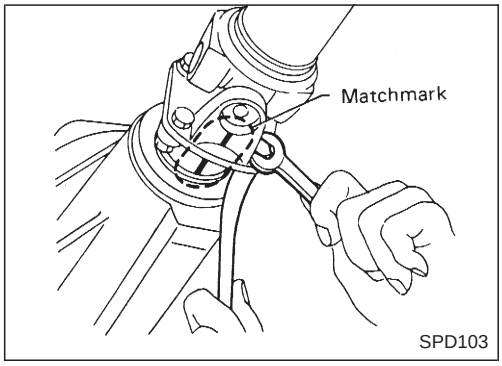
- Inspect propeller shaft tube surface for dents or cracks and replace as necessary.
- Check center bearing for noise or damage and replace as necessary.



SPD102

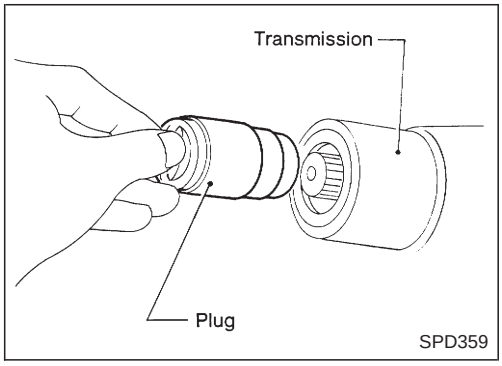
Removal and Installation

1. Place matching marks on flanges, then separate propeller shaft from final drive.



SPD103

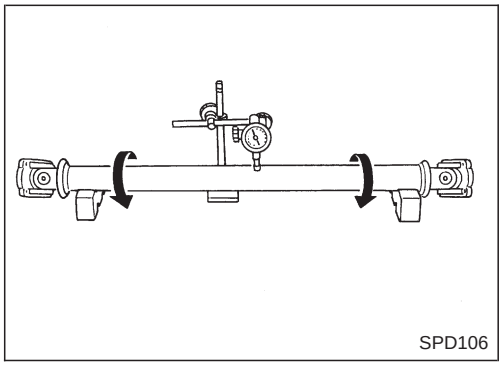
2. Remove propeller shaft.
- **Insert plug into rear oil seal after removing rear propeller shaft.**



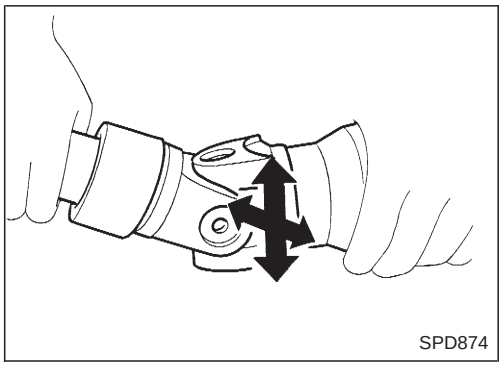
SPD359

Inspection

- Inspect propeller shaft runout. If runout exceeds the limit, replace propeller shaft assembly.
  Runout limit: 0.6 mm (0.024 in)


SPD106

Inspection (Cont'd)

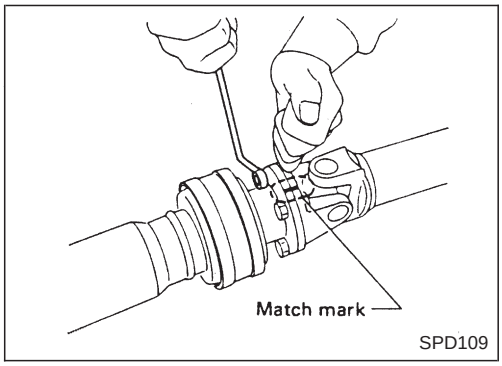

SPD874

- Inspect journal axial play.
  If play exceeds the limit, replace propeller shaft assembly.
  Journal axial play:
  0.02 mm (0.0008 in) or less

Disassembly

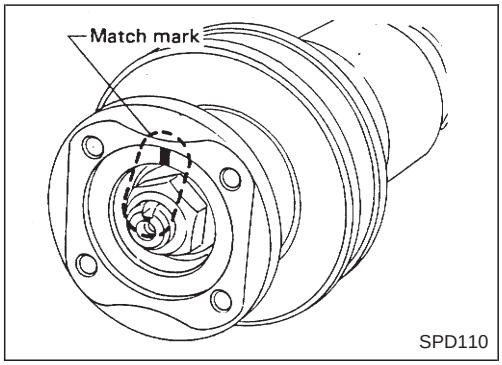
CENTER BEARING

1. Place matching marks on flanges, then separate 2nd tube from 1st tube.



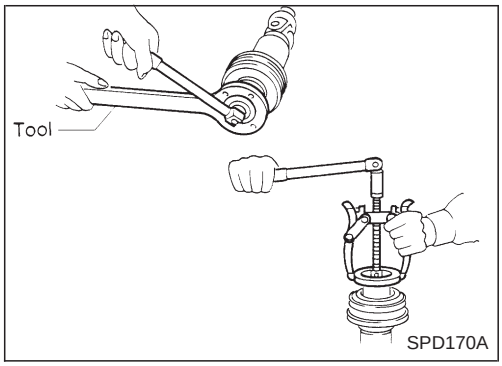
SPD109

2. Place matching marks on the flange and shaft.



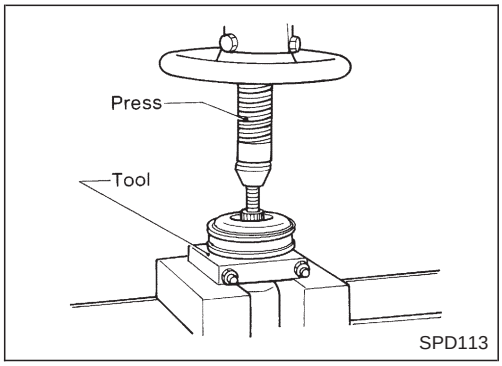
SPD110

3. Remove locking nut using Tool.
   Tool numbers:
   R180A, C200
   ST38060002
   H233B
   KV38104700
4. Remove companion flange using puller.



SPD170A

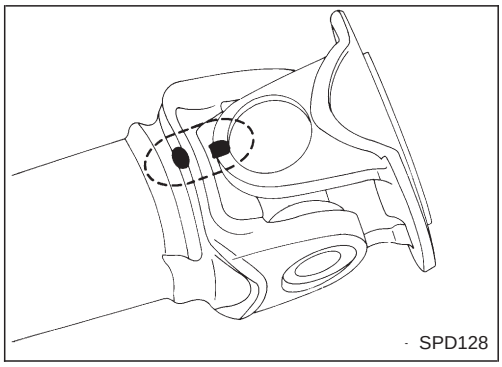
5. Remove center bearing using Tool and press.
   Tool number: ST30031000



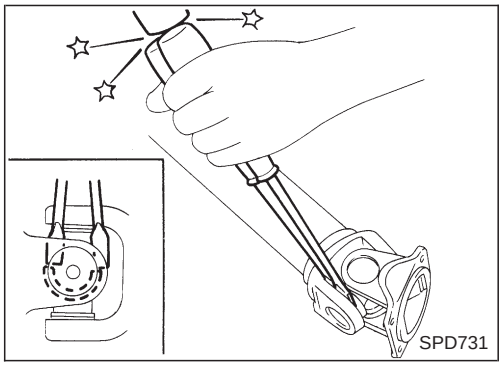
SPD113

Disassembly (Cont'd)

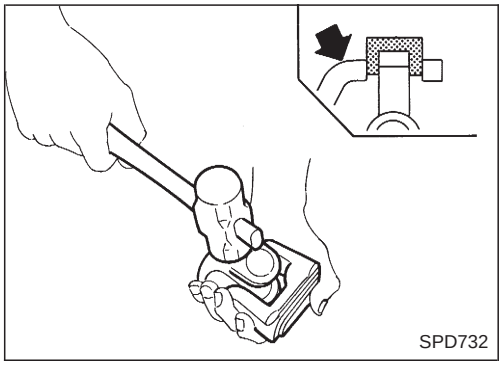
JOURNAL


SPD128

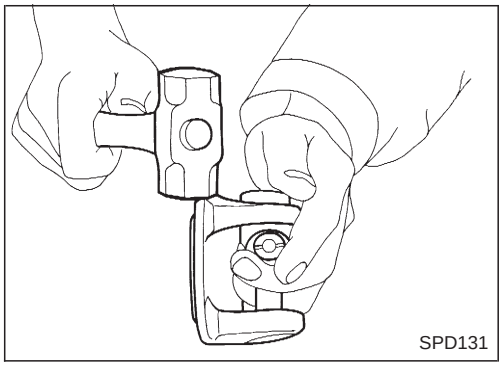
1. Place matching marks on propeller shaft and flange or yoke.


SPD731

2. Remove snap ring.


SPD732

3. Remove pushed out journal bearing by lightly tapping yoke with a hammer, taking care not to damage journal and yoke hole.

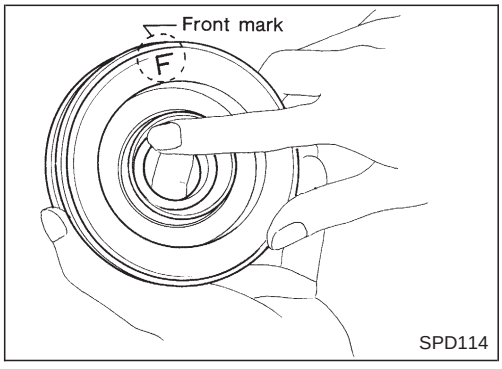

SPD131

4. Remove bearing at opposite side in above operation.

Put marks on disassembled parts so that they can be reinstalled in their original positions.

Assembly

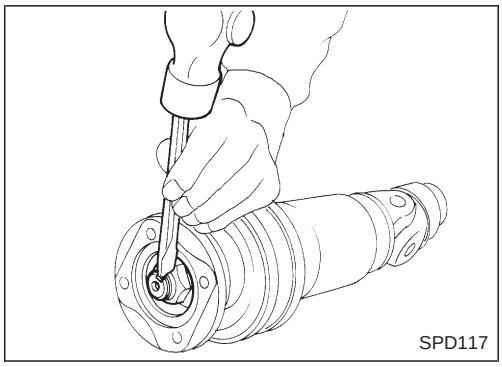
CENTER BEARING



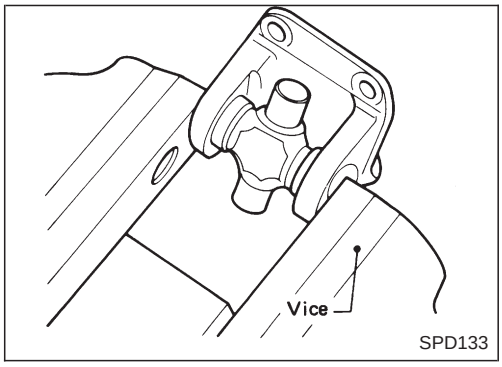
SPD114

- When installing center bearing, position the ''F'' mark on center bearing toward front of vehicle.
- **Apply a coat of multi-purpose lithium grease containing molybdenum disulfide to the end face of the center bearing and both sides of the washer.**

Assembly (Cont'd)


SPD117

- Stake the nut. Always use new one.
- Align match marks when assembling tubes.

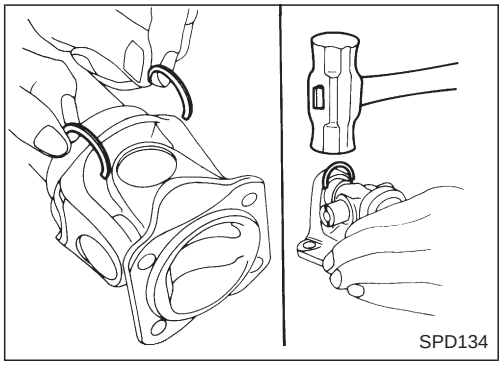


SPD133

JOURNAL

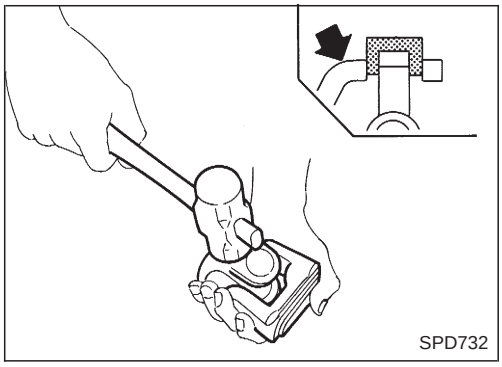
1. Assemble journal bearing. Apply recommended multi-purpose grease on bearing inner surface.

When assembling, be careful that needle bearing does not fall down.

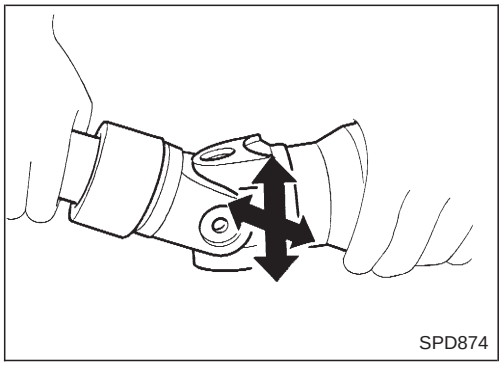

SPD134

2. Select snap ring that will provide specified play in axial direction of journal, and install them.
   Refer to SDS, PD-0.

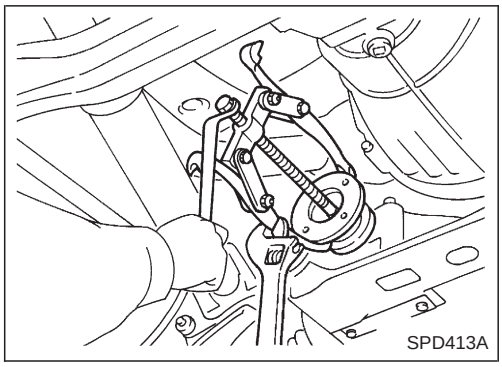
Select snap rings with a difference in thickness at both sides within 0.06 mm (0.0024 in).


SPD732

3. Adjust thrust clearance between bearing and snap ring to zero by tapping yoke.

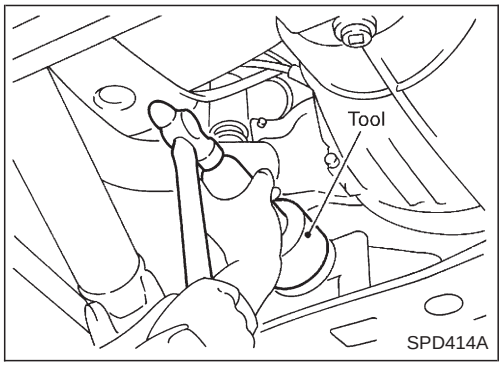

SPD874

4. Check to see that journal moves smoothly and check for axial play.
   Axial play: 0.02 mm (0.0008 in) or less


SPD413A

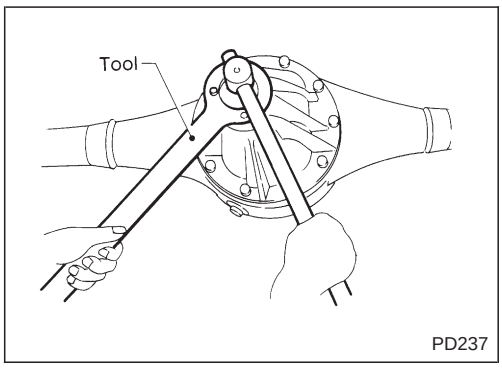
Front Oil Seal Replacement (Front final drive: Model R180A)

1. Remove front propeller shaft.
2. Loosen drive pinion nut.
3. Remove companion flange using puller.
4. Remove front oil seal.



SPD414A

5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.
   Tool number: KV38100500
6. Install companion flange and drive pinion nut.
7. Install propeller shaft.

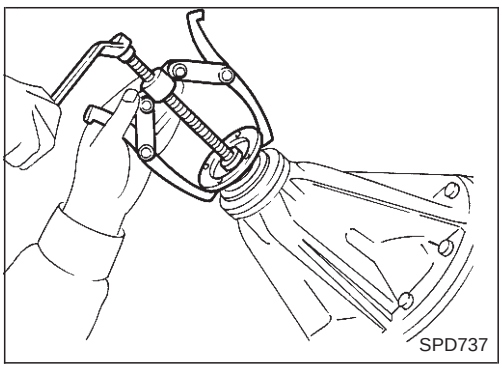


PD237

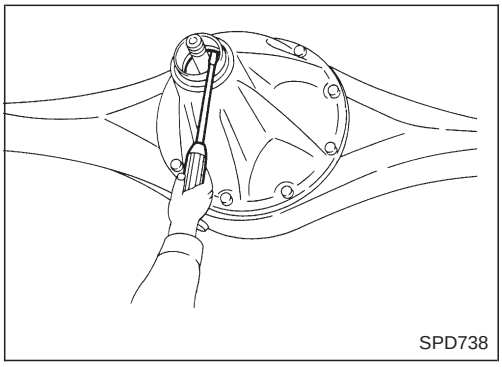
Front Oil Seal Replacement (Rear final drive: Model H233B)

CAUTION:
For final drive models using collapsible spacer (C200), bearing preload must be adjusted whenever companion flange is removed. Therefore, final drive overhaul is required.

1. Remove propeller shaft.
2. Loosen drive pinion nut.
   Tool number: KV38104700

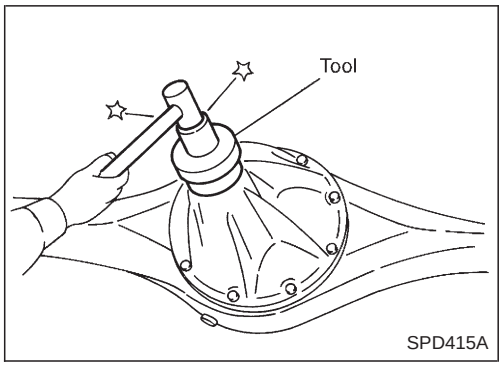

SPD737

3. Remove companion flange.


SPD738

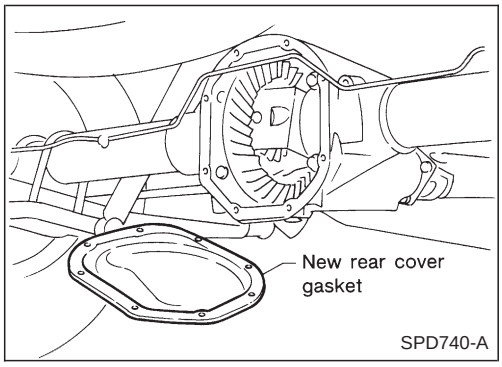
4. Remove front oil seal.

Front Oil Seal Replacement (Rear final drive: Model H233B) (Cont'd)

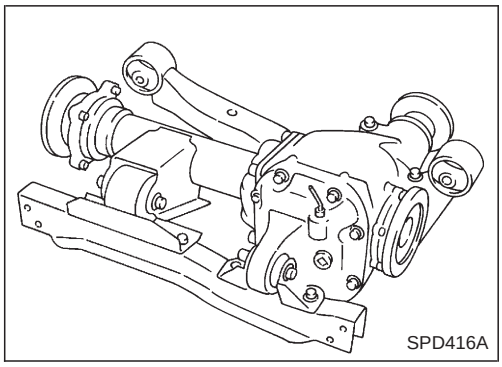


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Press front oil seal into carrier.
   Tool numbers: ST15310000
   KV40104710
6. Install companion flange and drive pinion nut.
7. Install rear propeller shaft.

Rear Cover Gasket Replacement (Rear final drive: Model C200)

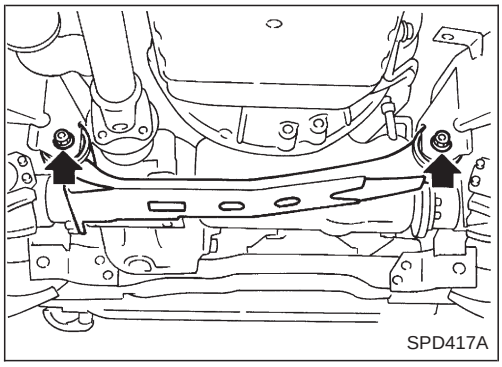


1. Drain gear oil.
2. Remove rear cover and rear cover gasket.
3. Install new rear cover gasket and rear cover.
4. Fill final drive with recommended gear oil.


SPD416A

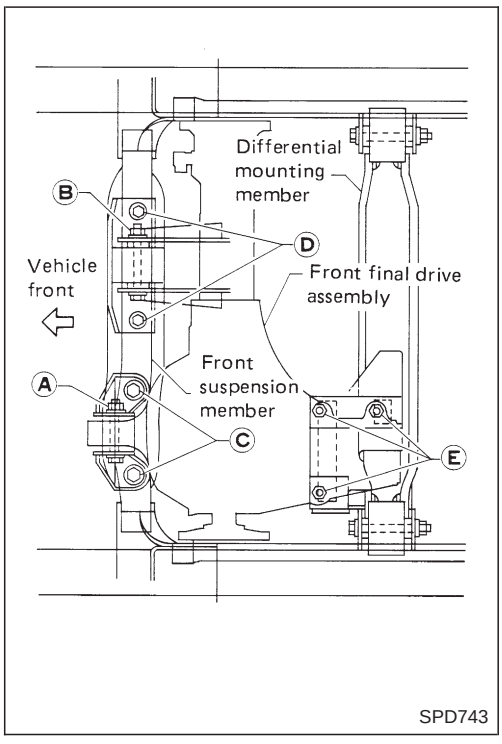
Removal

1. Remove front propeller shaft.
2. Remove drive shaft. Refer to FA section [“Drive Shaft”, “FRONT AXLE (4WD)”].
3. Remove engine mounting bolts and raise up engine.
4. Remove front final drive together with differential mounting member.


SPD417A

Installation

1. Install front final drive assembly together with differential mounting member.



SPD743

2. Tighten front final drive securing bolts and nuts by following the procedure to prevent drive train vibration.

a. Temporarily tighten nut Ⓐ.
b. Temporarily tighten nut Ⓑ.
c. Tighten bolt Ⓒ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
d. Tighten bolt Ⓓ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
e. Tighten nut Ⓐ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
f. Tighten nut Ⓑ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).
g. Tighten nut Ⓔ to the torque of 68 to 87 N·m (6.9 to 8.9 kg-m, 50 to 64 ft-lb).

3. Install drive shaft. Refer to FA section [“Drive Shaft”, “FRONT AXLE (4WD)”].
4. Install front propeller shaft.

Removal

- Remove propeller shaft.

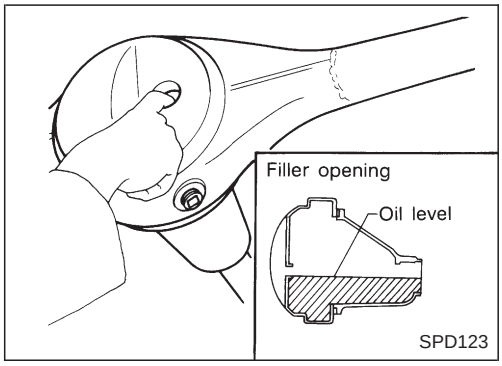
Plug front end of transfer.

- Remove axle shaft.
  Refer to RA section (“REAR AXLE”).

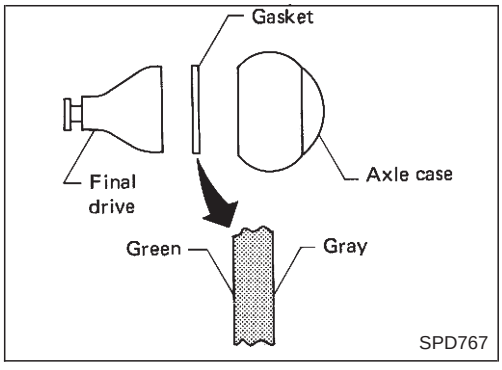
CAUTION:

- **Be careful not to damage spline, sleeve yoke and front oil seal when removing propeller shaft.**
- **Before removing the final drive assembly or rear axle assembly, disconnect the ABS sensor harness connector from the assembly and move it away from the final drive/rear axle assembly area. Failure to do so may result in the sensor wires being damaged and the sensor becoming inoperative.**

Installation



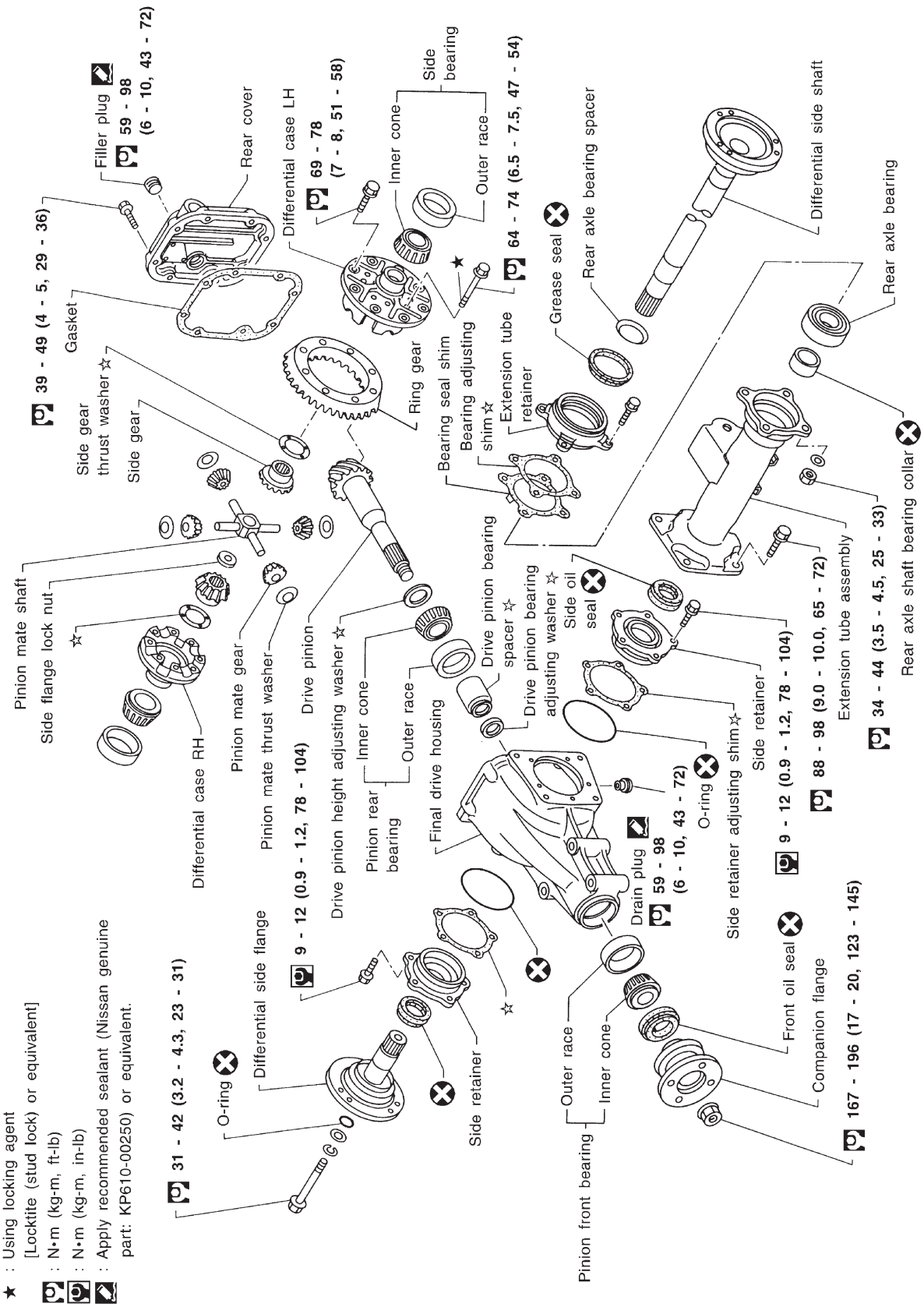
- Fill final drive with recommended gear oil.



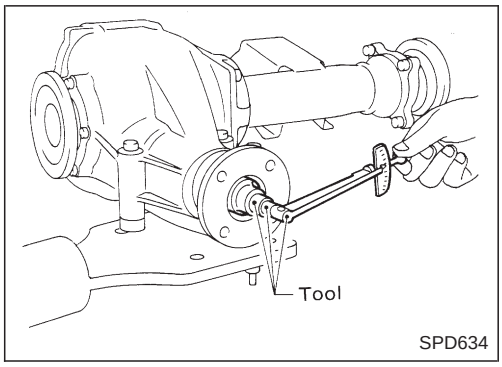
- Pay attention to the direction of gasket (H233B only).

SEC. 381

☆ : Adjustment is required.
★ : Using locking agent [Locktite (stud lock) or equivalent]
: N•m (kg-m, ft-lb)
: N•m (kg-m, in-lb)
: Apply recommended sealant (Nissan genuine part: KP610-00250) or equivalent.



SPD429AB



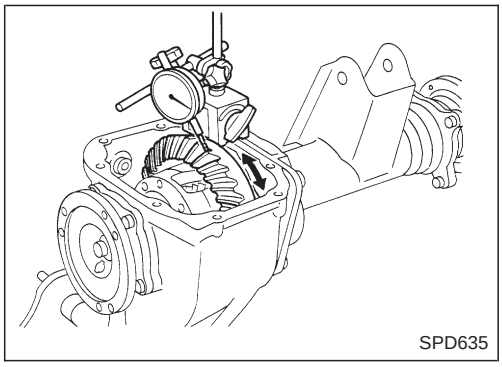
SPD634

Pre-inspection

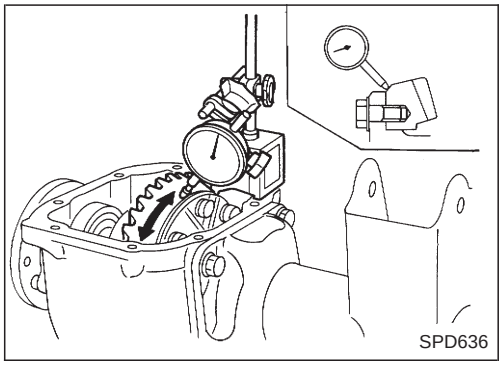
Before disassembling final drive, perform the following inspection.

- Total preload

a. Turn drive pinion in both directions several times to set bearing rollers.
b. Check total preload with Tool.
   Tool number: ST3127S000
   Total preload:
   1.2 - 2.3 N·m
   (12 - 23 kg-cm, 10 - 20 in-lb)


SPD635

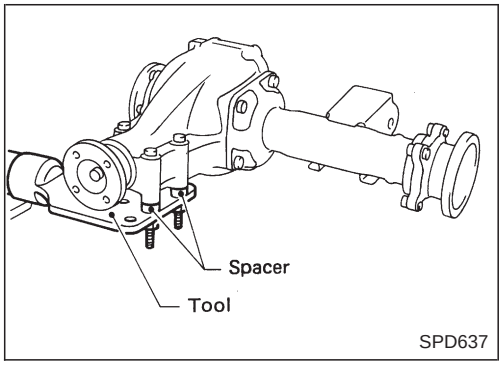
- Ring gear-to-drive pinion backlash
  Check backlash of ring gear with a dial indicator at several points.
  Ring gear-to-drive pinion backlash:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)


SPD636

- Ring gear runout
  Check runout of ring gear with a dial indicator.
  Runout limit:
  0.05 mm (0.0020 in)
- Tooth contact
  Check tooth contact. Refer to ‘‘ADJUSTMENT’’, PD-26.

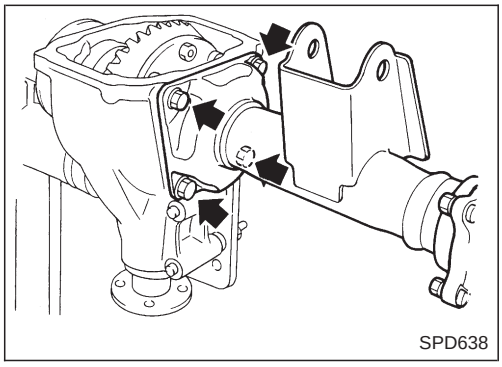
Final Drive Housing

1. Using three spacers [20 mm (0.79 in)], mount final drive assembly on Tool.
   Tool number: KV38100800

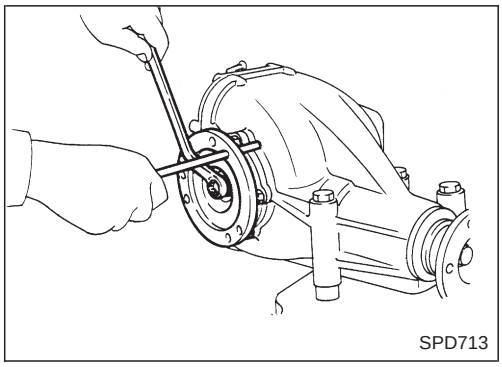


SPD637

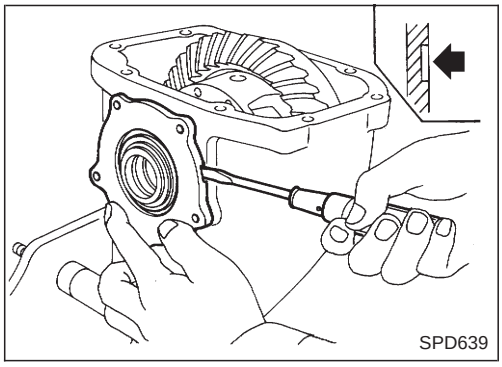
2. Remove extension tube and differential side shaft assembly.


SPD638

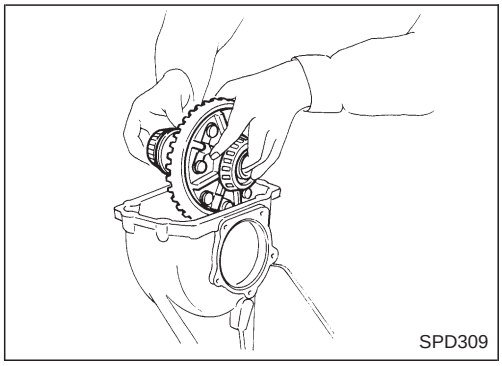
Final Drive Housing (Cont'd)


SPD713

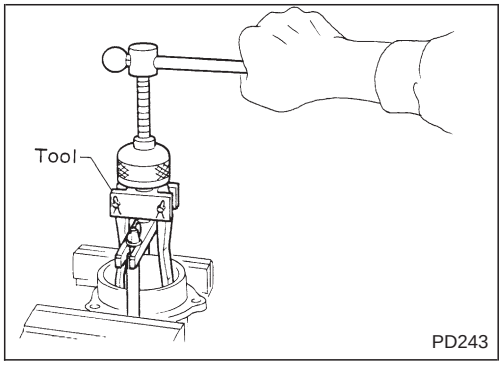
3. Remove differential side flange.


SPD639

4. Mark side retainers for identification. Remove side retainers.
Be careful not to confuse right and left side retainers and shims.


SPD309

5. Extract differential case from final drive housing.

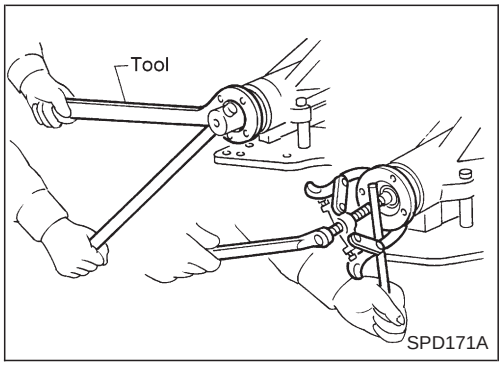


PD243

6. Remove side outer races.
Tool number: ST33290001

Keep the side bearing outer races together with their respective inner cones — do not mix them up.

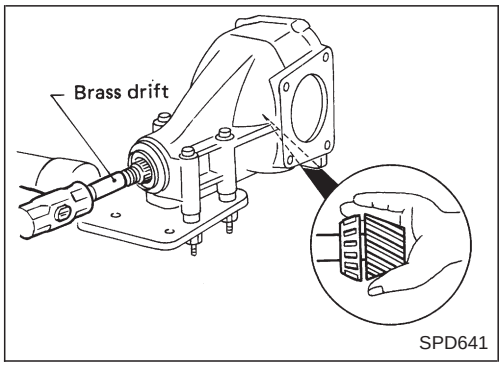
7. Remove side oil seal.



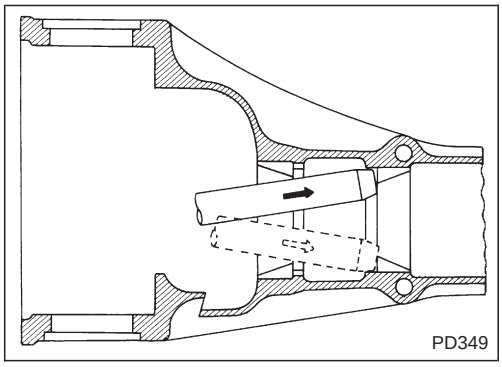
SPD171A

8. Loosen drive pinion nut.
Tool number: ST38060002
9. Remove companion flange with puller.

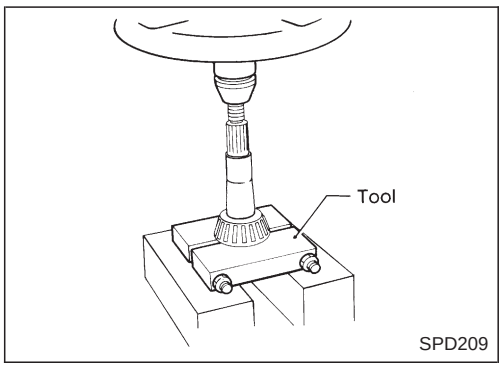
Final Drive Housing (Cont'd)



10. Take out drive pinion together with pinion rear bearing inner cone, drive pinion bearing spacer and pinion bearing adjusting washer.
11. Remove front oil seal and pinion front bearing inner cone.

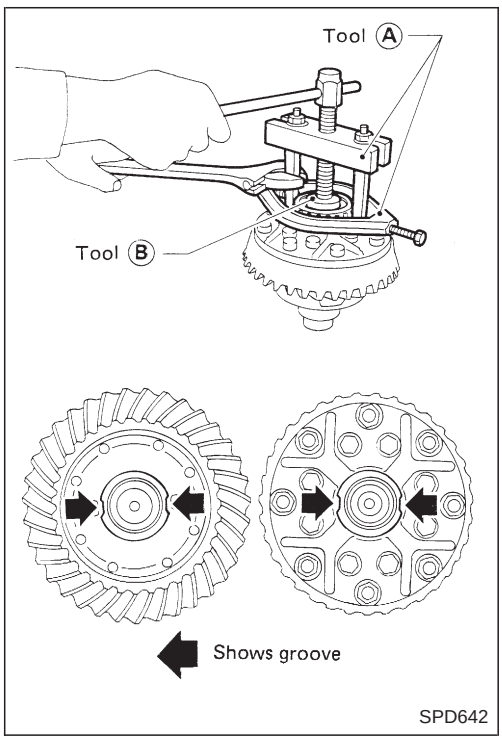


12. Remove pinion front and rear bearing outer races with brass drift.



13. Remove pinion rear bearing inner cone and drive pinion adjusting washer.
    Tool number: ST30031000

Differential Case



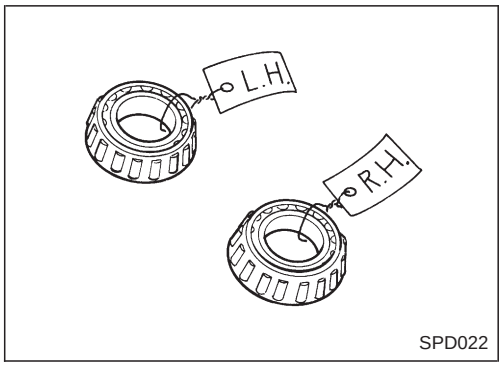
1. Remove side bearing inner cones.

To prevent damage to bearing, engage puller jaws in grooves.

Tool numbers:
- Ⓐ **ST33051001**
- Ⓑ **ST33061000**

Differential Case (Cont'd)

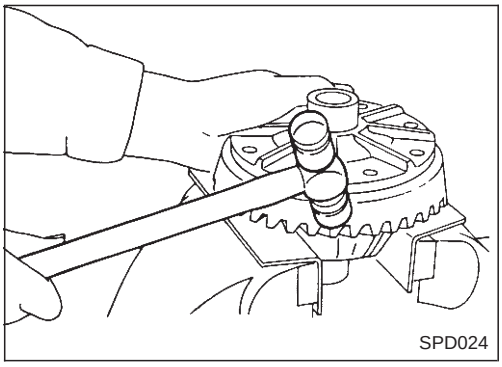
Be careful not to confuse the right and left hand parts.



SPD022

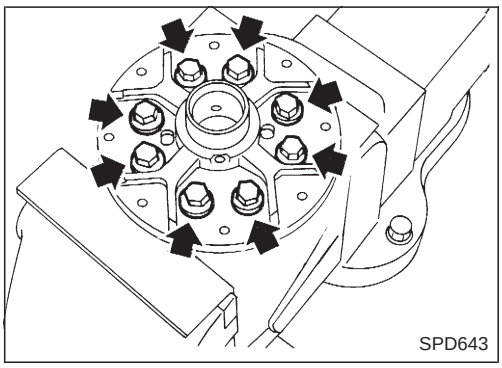
2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.


SPD024

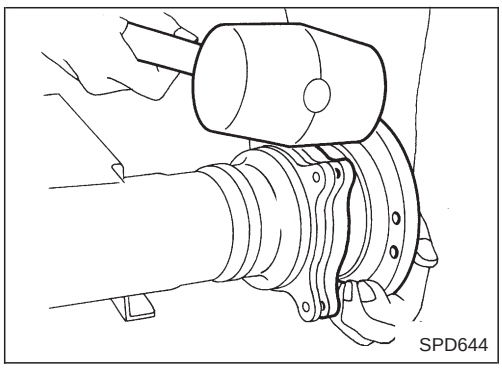
4. Separate differential case LH and RH.

Put match marks on both differential case LH and RH sides prior to separating them.

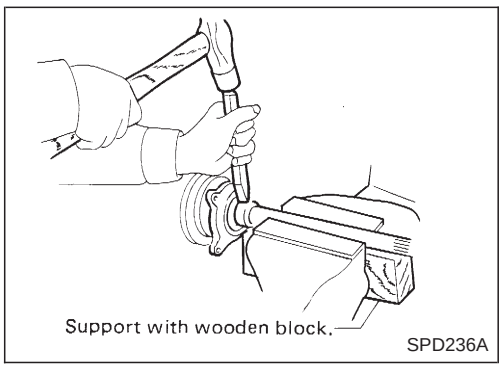

SPD643

Extension Tube and Differential Side Shaft

1. Remove differential side shaft assembly from extension tube.

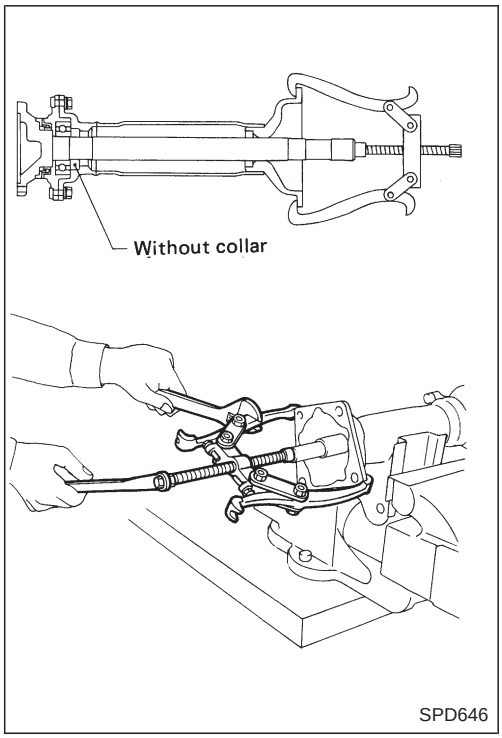

SPD644

2. Cut rear axle bearing collar with cold chisel. Be careful not to damage differential side shaft.



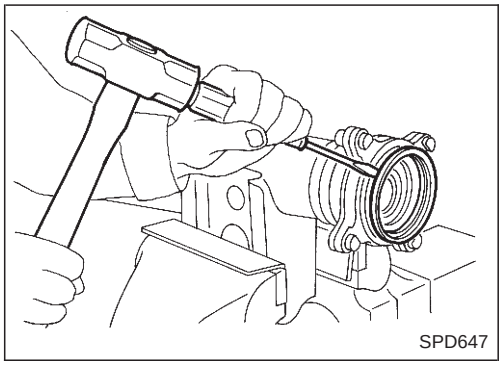
SPD236A

Extension Tube and Differential Side Shaft (Cont'd)



SPD646

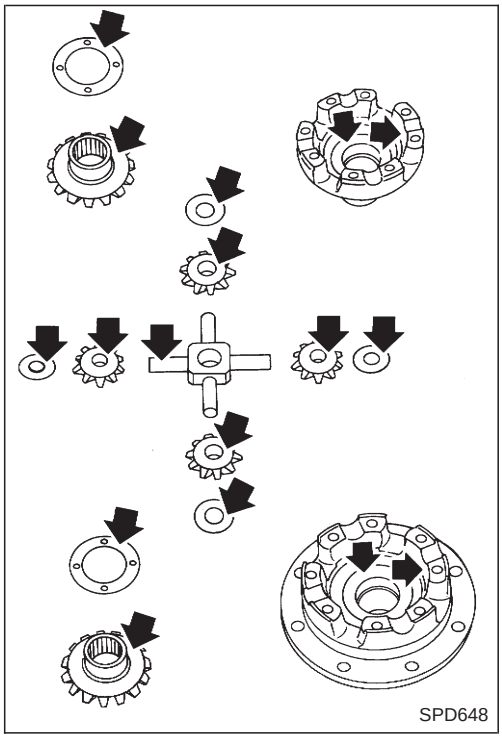
3. Reinstall differential side shaft into extension tube and secure with bolts. Remove rear axle bearing by drawing out differential side shaft from rear axle bearing with puller.


SPD647

4. Remove grease seal.

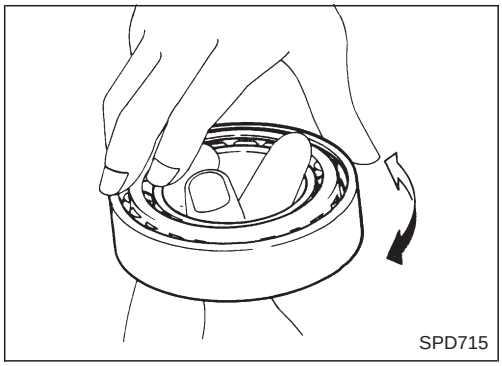
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping.
If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).


SPD648

Differential Case Assembly

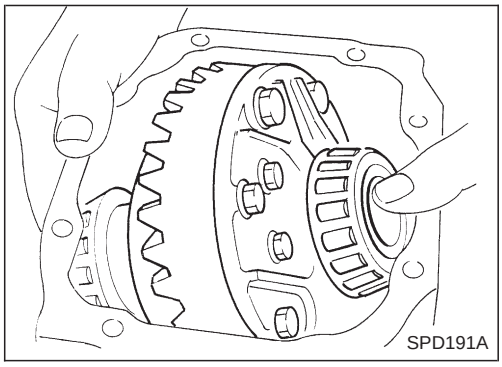
Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft and thrust washers.


SPD715

Bearing

1. Thoroughly clean bearing.
2. Check bearing for wear, scratches, pitting or flaking.
   Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.

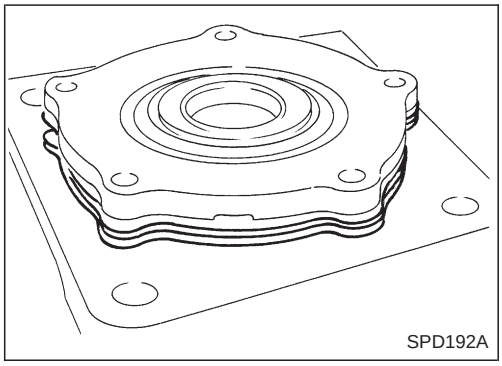
For quiet and reliable final drive operation, the following five adjustments must be made correctly:
1. Side bearing preload
2. Pinion gear height
3. Pinion bearing preload
4. Ring gear-to-pinion backlash. Refer to ''ASSEMBLY'', PD-30.
5. Ring and pinion gear tooth contact pattern


SPD191A

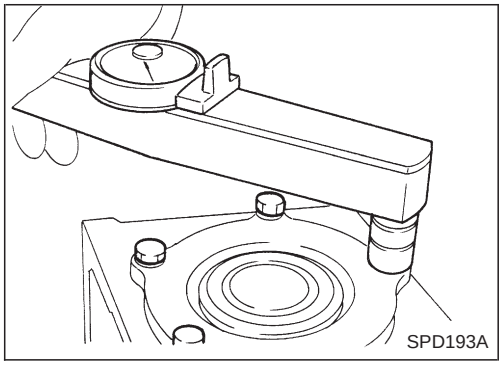
Side Bearing Preload

A selection of carrier side retainer adjusting shims is required for successful completion of this procedure.

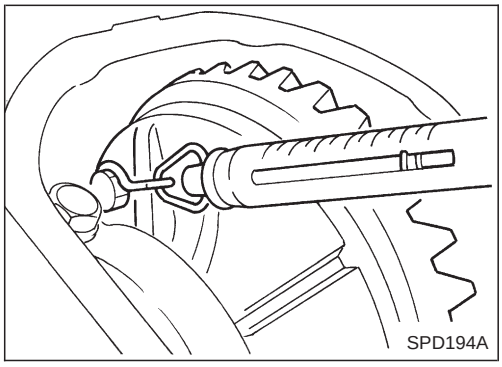
1. Make sure all parts are clean. Also make sure the bearings are well lubricated with light oil or type ''DEXRON™'' automatic transmission fluid.
2. Install differential carrier and side bearing assembly into the final drive housing.


SPD192A

3. Place all of the original side retainer adjusting shims onto the side bearing retainer that goes at the ring gear end of the carrier.


SPD193A

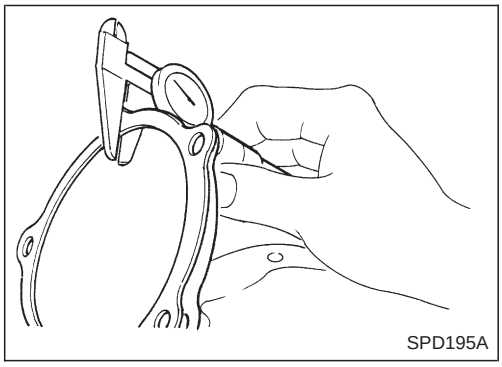
4. Install both bearing retainers onto the final drive housing and torque the retainer bolts.
   Bolt torque specification:
   : 9 - 12 N·m (0.9 - 1.2 kg-m, 78 - 104 in-lb)


SPD194A

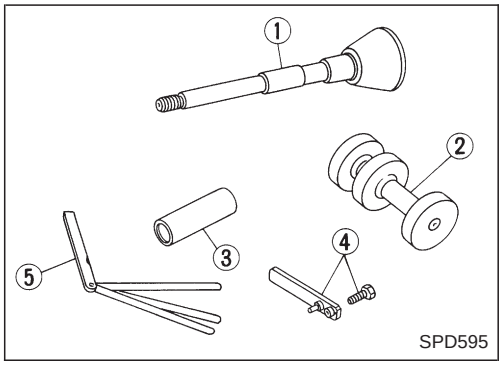
5. Turn the carrier several times to seat the bearings.
6. Measure the carrier turning torque with a spring gauge at the ring gear retainer bolt.
   Turning torque specification:
   34.3 - 39.2 N (3.5 - 4.0 kg, 7.7 - 8.8 lb)
   of pulling force at the ring gear bolt

Side Bearing Preload (Cont'd)

7. If the turning torque measured is incorrect, establish the correct bearing preload by adding to or subtracting from the total amount of shim thickness.
- Increase shim thickness to decrease turning torque on the carrier.
- Decrease shim thickness to increase turning torque on the carrier.


SPD195A

8. Record the correct, selected total thickness of the side retainer adjusting shims, and remove the carrier and bearings from the final drive housing. Save all shims for later reuse.

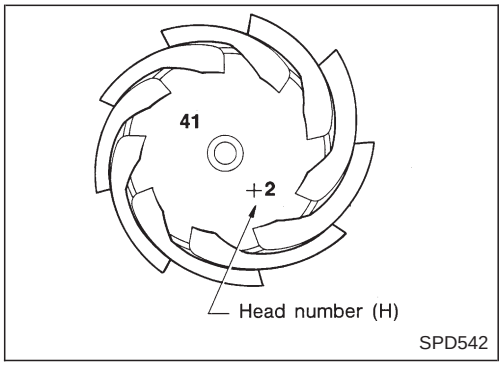


SPD595

Drive Pinion Height

1. First prepare Tools for pinion height adjustment.
   ① Dummy Shaft (KV38100110)
   ② Height Gauge (KV38100120)
   ③ Collar (KV38100130)
   ④ Stopper (KV38100140)
   ⑤ Feeler Gauge
2. To simplify the job, make a chart, like the one below, to organize your calculations.

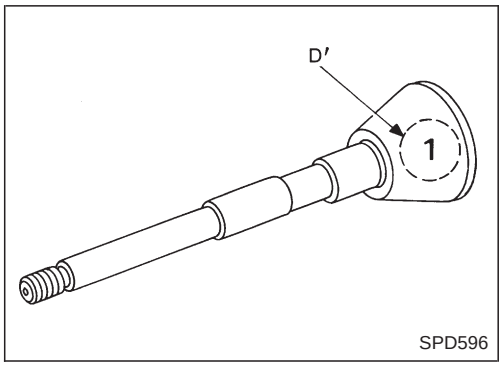
LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
D′: Figure marked on dummy shaft	
N: Measuring clearance	



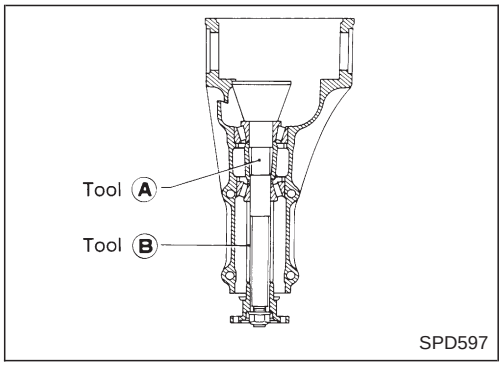
SPD542

3. Write the following numbers down the chart.
   H: Head number

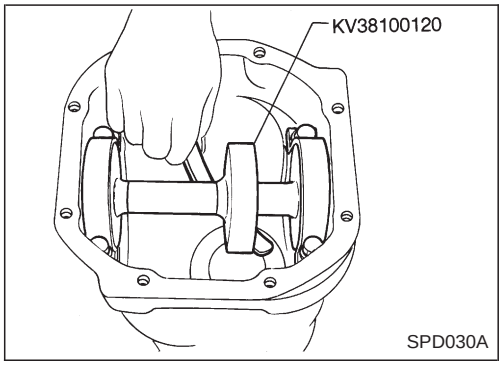
Drive Pinion Height (Cont'd)



D′: Figure marked on dummy shaft.



4. Set Tool (Dummy shaft) as shown below and tighten drive pinion nut carefully to correct preload of 1.1 to 1.4 N·m (11 to 14 kg-cm, 9.5 to 12.2 in-lb).
   Tool numbers:
   - Ⓐ **Dummy shaft (KV38100110)**
   - Ⓑ **Collar (KV38100130)**



5. Attach Tool (Height gauge) to gear carrier, and measure the clearance between the height gauge and the dummy shaft face.
6. Substitute these values into the equation to calculate the thickness of the washer.

If values signifying H and D′ are not given, regard them as zero and calculate.

T (Thickness of washer) = N − [(H − D′) x 0.01] + 3.00

Example:

N = 0.23
H = 2
D′ = 1

T = N − [(H − D′) x 0.01] + 3.00
= 0.23 − [(2 − 1) x 0.01] + 3.00

(1) H 2
−D′ ..... −1
+1

(2) +1 x 0.01 = +0.01

(3) N ..... 0.23 − (+0.01) = 0.22

(4) 0.22 +3.00 = 3.22

∴T = 3.22

7. Select the proper pinion height washer.
   Drive pinion height adjusting washer:
   Refer to SDS, PD-78.

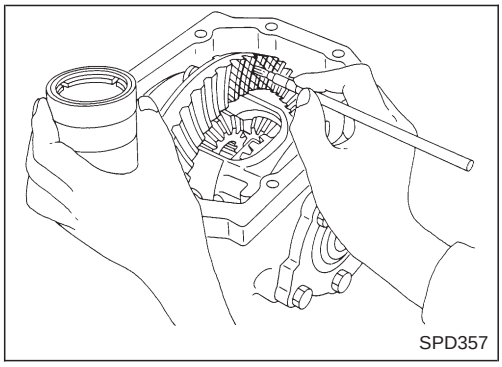
If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

Example:

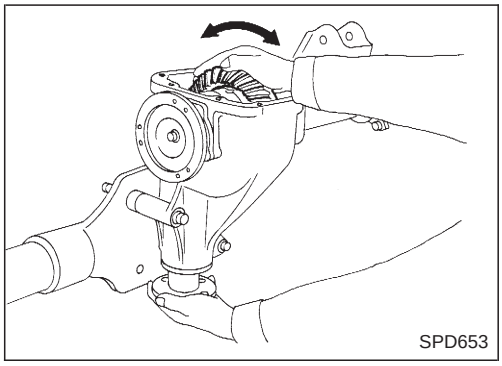
Calculated value ... T = 3.22 mm
Used washer ... T = 3.21 mm

Tooth Contact

Gear tooth contact pattern check is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear sets which are not positioned properly may be noisy, or have short life, or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

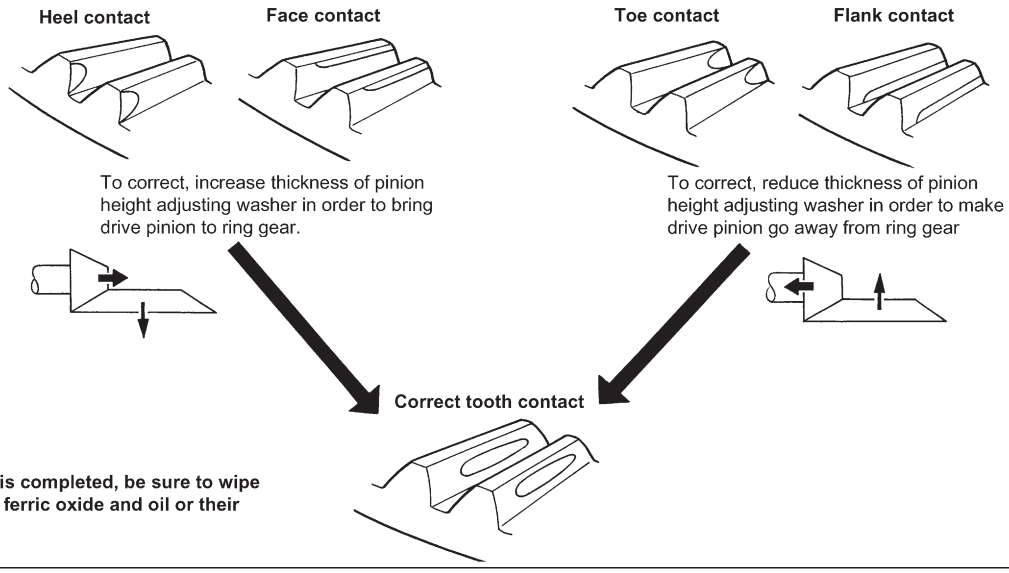

SPD357

1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.


SPD653

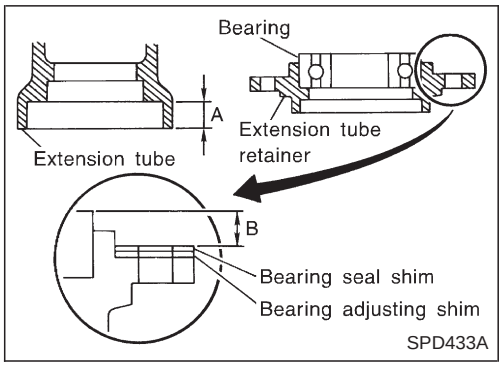
3. Hold companion flange steady and rotate the ring gear in both directions.

Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
The tooth pattern is the best indication of how well a differential has been set up.



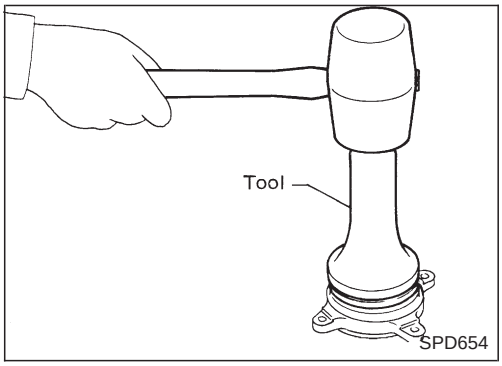
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SPD007

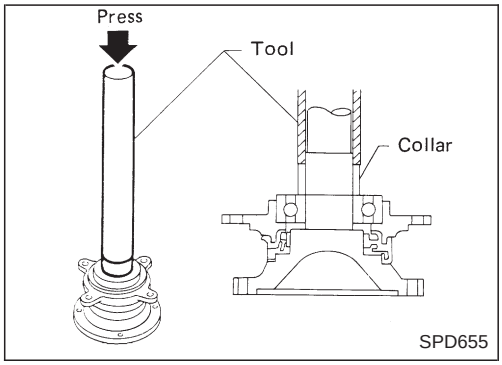


Extension Tube and Differential Side Shaft

1. Measure rear axle bearing end play.
   Rear axle bearing end play (A − B):
   0.1 mm (0.004 in) or less
   The end play can be adjusted with bearing adjusting shim.
   Available bearing adjusting shims:
   Refer to SDS, PD-78.

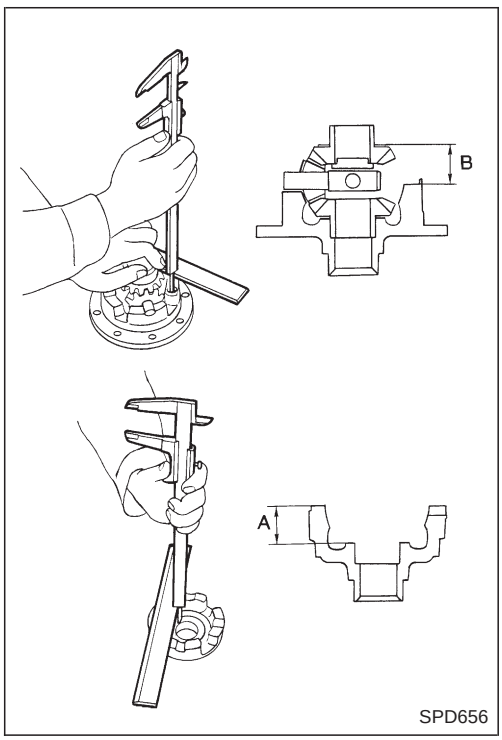


2. Install grease seal.



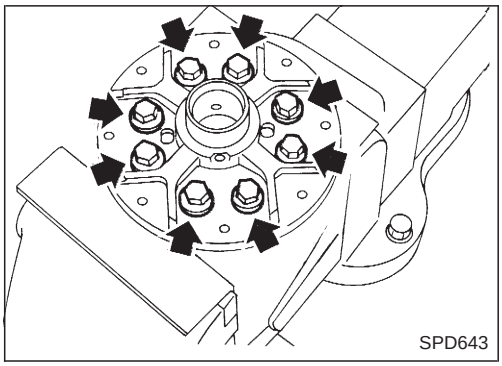
3. Install extension tube retainer, rear axle bearing and rear axle shaft bearing collar on differential side shaft.
4. Install differential side shaft assembly into extension tube.

Differential Case

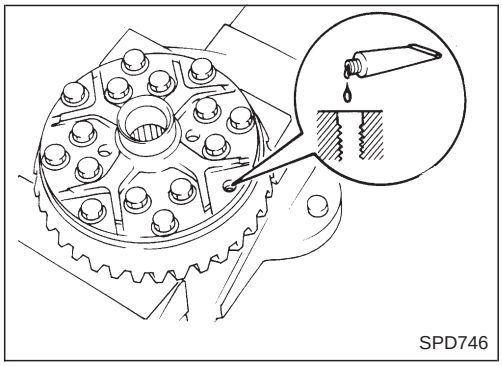


1. Measure clearance between side gear thrust washer and differential case.
   Clearance between side gear thrust washer and differential case (A − B):
   Less than 0.15 mm (0.0059 in)
   The clearance can be adjusted with side gear thrust washer.
   Available side gear thrust washers:
   Refer to SDS, PD-78.
2. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see they turn properly.

Differential Case (Cont'd)

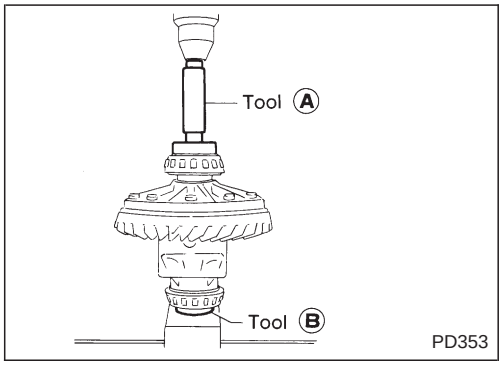

SPD643

3. Install differential case LH and RH.


SPD746

4. Place differential case on ring gear.
5. Apply locking agent [Locktite (stud lock) or equivalent] to ring gear bolts, and install them.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

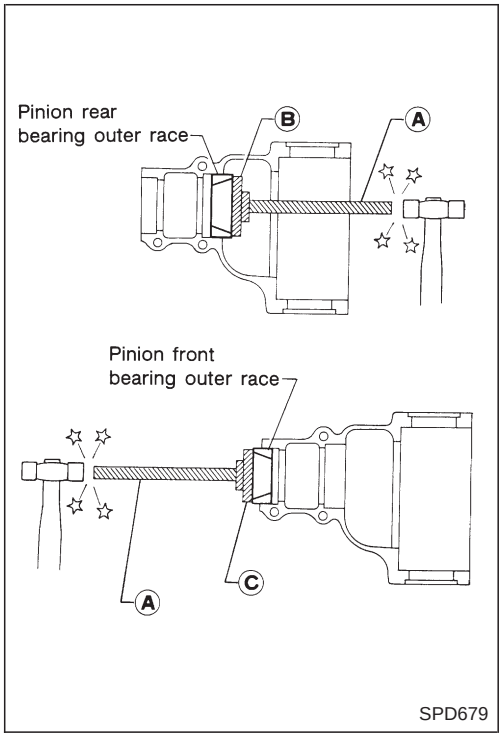


PD353

6. Press-fit side bearing inner cones on differential case with Tools.

Tool numbers:
- Ⓐ **ST33230000**
- Ⓑ **ST33061000**

Final Drive Housing

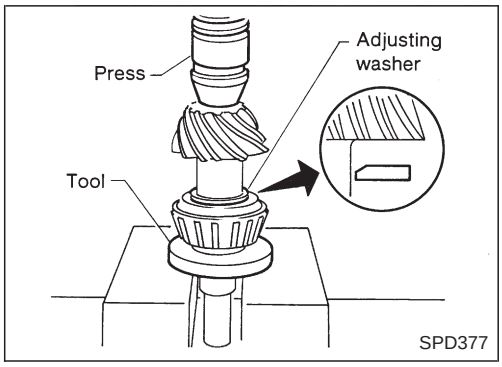


SPD679

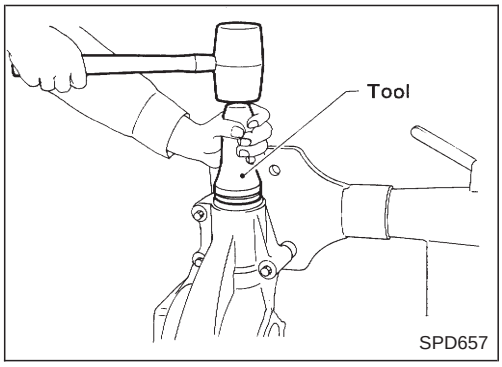
1. Press-fit front and rear bearing outer races with Tools.

Tool numbers:
- Ⓐ **ST30611000**
- Ⓑ **ST30621000**
- Ⓒ **ST30701000**

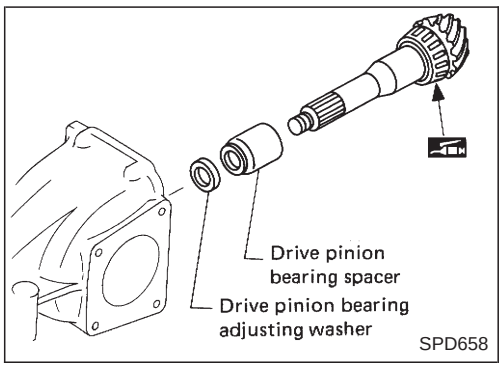
Final Drive Housing (Cont'd)



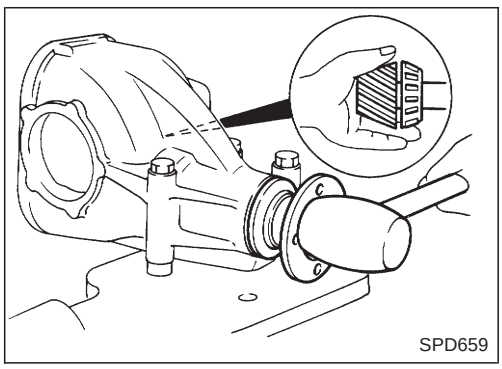
2. Select drive pinion bearing adjusting washer and drive pinion height adjusting washer. Refer to ''ADJUSTMENT'', PD-24.
3. Install drive pinion height adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it, using press and Tool.
   Tool number: ST30901000



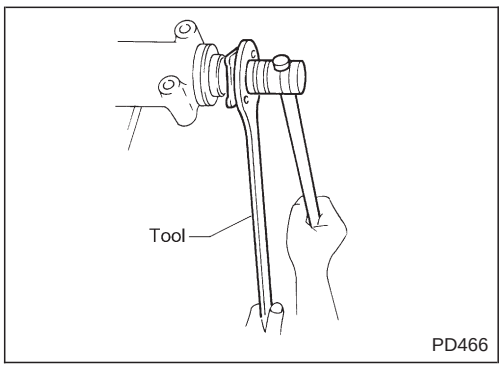
4. Place pinion front bearing inner cone in final drive housing.
5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.
   Tool number: ST30720000



6. Place drive pinion bearing spacer, pinion bearing adjusting washer and drive pinion in final drive housing.



7. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.

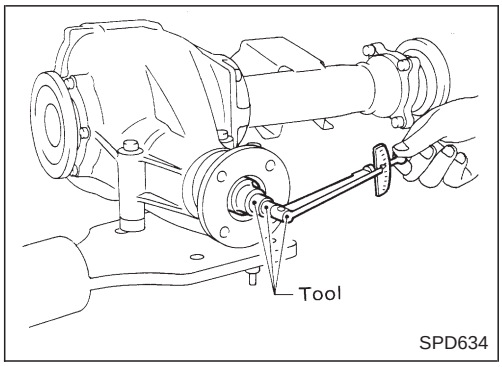


8. Tighten pinion nut to the specified torque.

The threaded portion of drive pinion and pinion nut should be free from oil or grease.

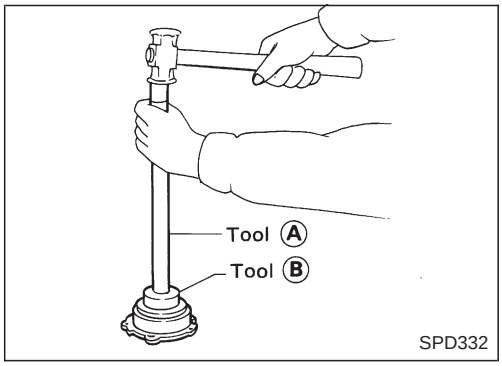
Tool number: ST38060002

Final Drive Housing (Cont'd)

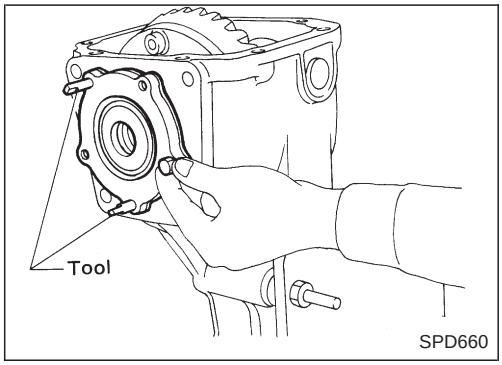


9. Turn drive pinion in both directions several revolutions and measure pinion bearing preload.
   Tool number: ST3127S000
   Pinion bearing preload (With front oil seal):
   1.1 - 1.7 N·m (11 - 17 kg-cm, 9.5 - 14.8 in-lb)
   Pinion bearing preload (Without front oil seal):
   1.0 - 1.6 N·m (10 - 16 kg-cm, 8.7 - 13.9 in-lb)

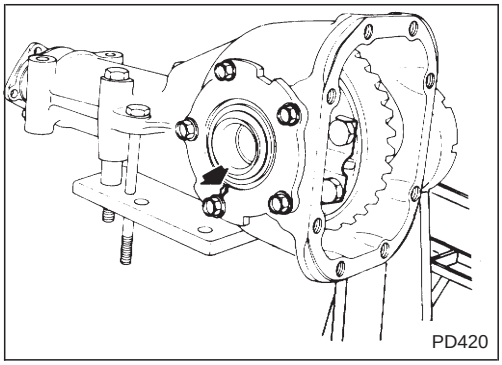
When pinion bearing preload is outside the specifications, replace pinion bearing adjusting washer and spacer with a different thickness.



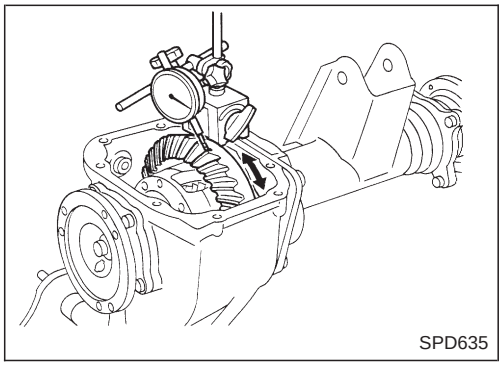
10. Select side retainer adjusting shim.
    Refer to ''ADJUSTMENT'', PD-23.
11. Press-fit side bearing outer race into side retainer.
    Tool numbers:
    Ⓐ **ST30611000**
    Ⓑ **ST30621000**



12. Install side oil seal to side retainer.
    Tool number: ST33270000
13. Install differential case assembly.
14. Place side retainer adjusting shims (refer to ''ADJUSTMENT'', PD-23), and O-ring on side retainer, and install them in final drive housing.
    Tool number: ST33720000



- Align arrows stamped on side retainer and final drive housing.

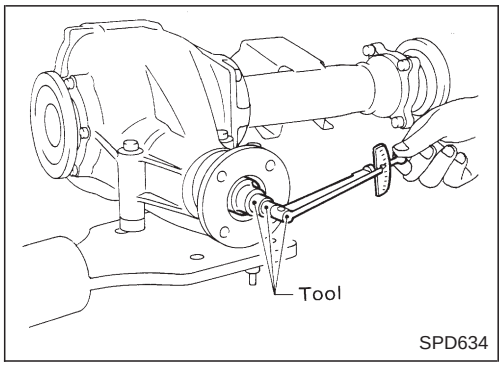


15. Measure ring gear-to-drive pinion backlash with a dial indicator.
    Ring gear-to-drive pinion backlash:
    0.13 - 0.18 mm (0.0051 - 0.0071 in)

- If backlash is too small, decrease thickness of right shim and increase thickness of left shim by the same amount.
  If backlash is too great, reverse the above procedure.

Never change the total amount of shims as it will change the bearing preload.

Final Drive Housing (Cont'd)



16. Check total preload with Tool.

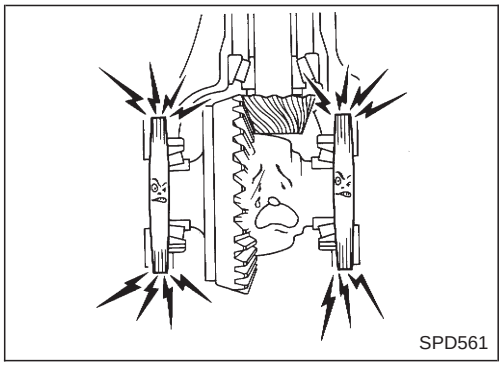
When checking preload, turn drive pinion in both directions several times to set bearing rollers.

Tool number: ST3127S000

Total preload:

1.2 - 2.3 N·m

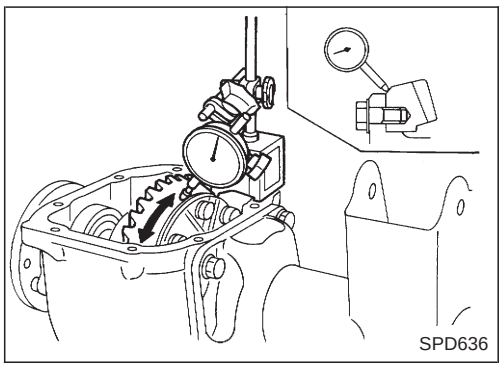
(12 - 23 kg-cm, 10 - 20 in-lb)



- If preload is too great, add the same amount of shim to each side.
- If preload is too small, remove the same amount of shim from each side.

Never add or remove a different number of shims for each side as it will change ring gear-to-drive pinion backlash.

17. Recheck ring gear-to-drive pinion backlash because increase or decrease in thickness of shims will cause change of ring gear to pinion backlash.



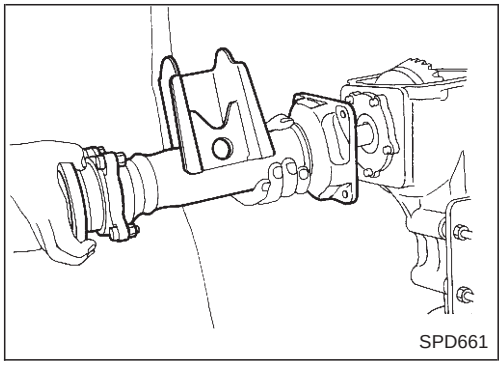
18. Check runout of ring gear with a dial indicator.

Runout limit:

0.05 mm (0.0020 in)

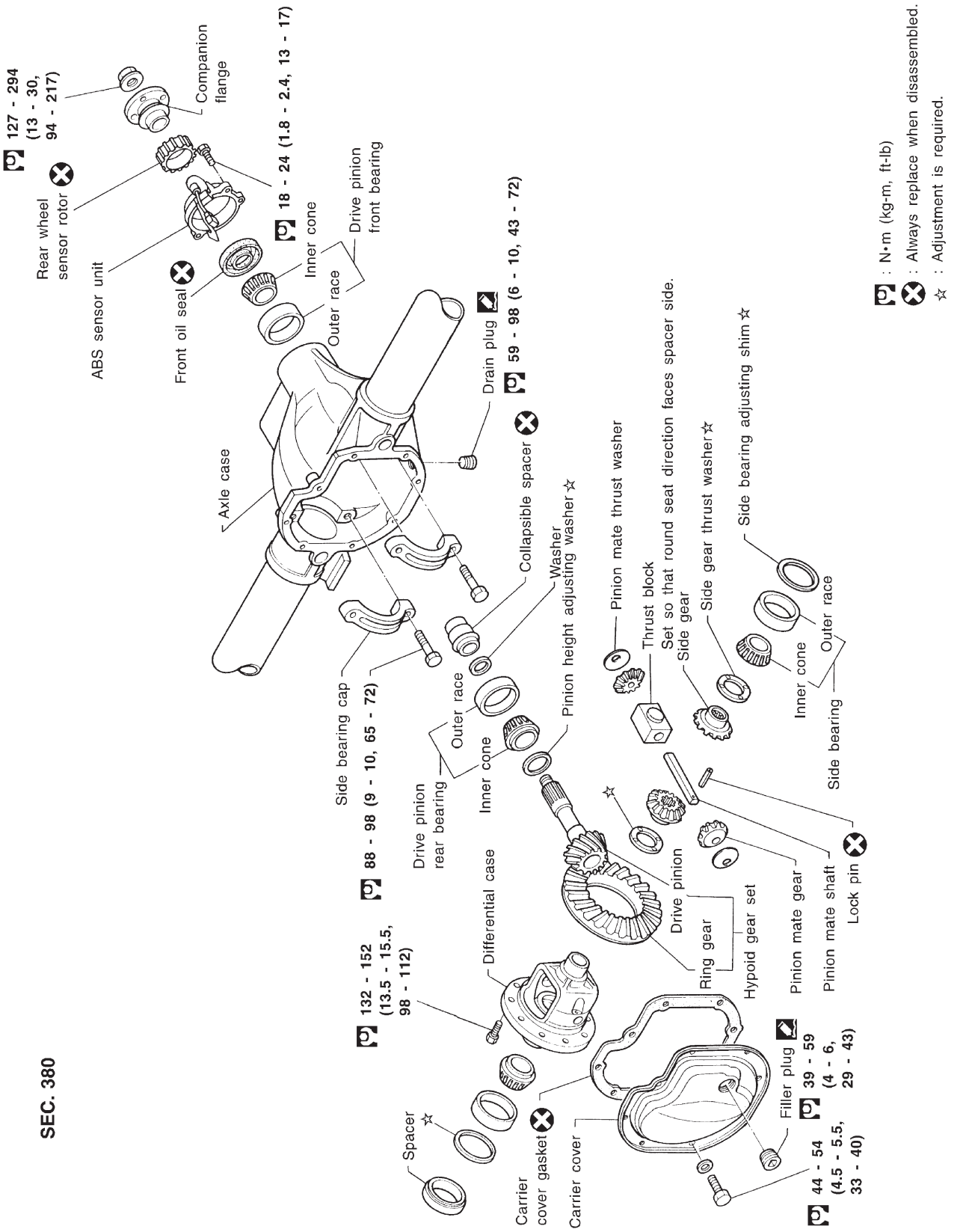
- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.
- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.

19. Check tooth contact. Refer to ''ADJUSTMENT'', PD-26.
20. Install rear cover and gasket.



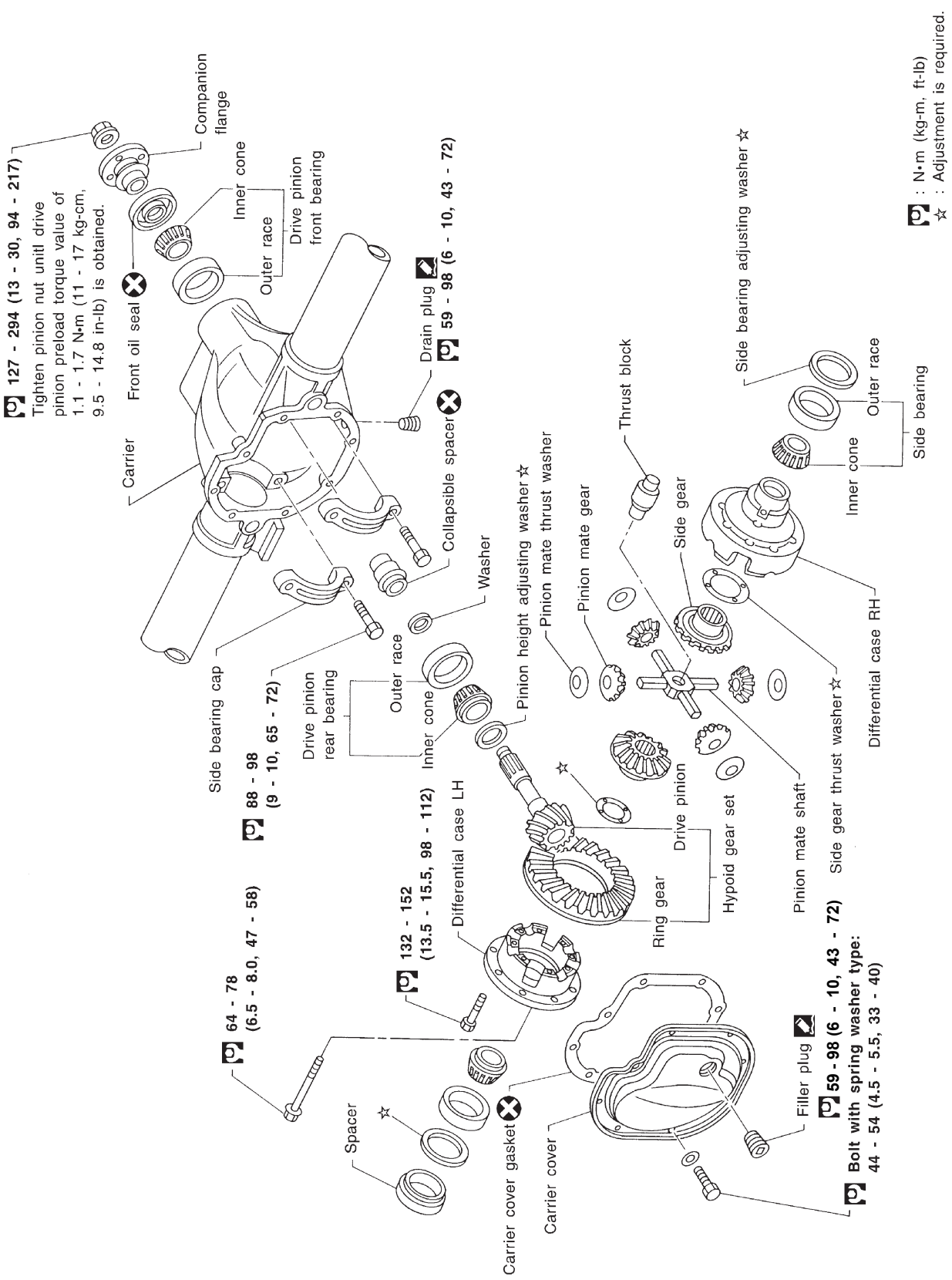
21. Install extension tube and differential side shaft assembly.

2-pinion model

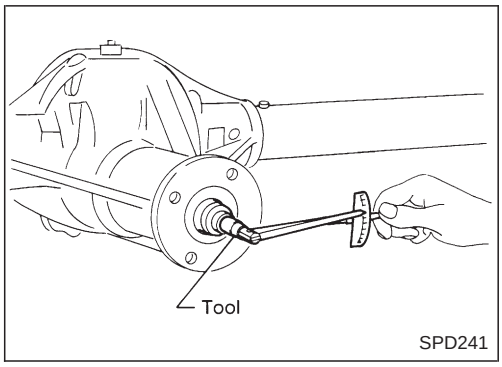


SPD425A

4-pinion model



SPD426A

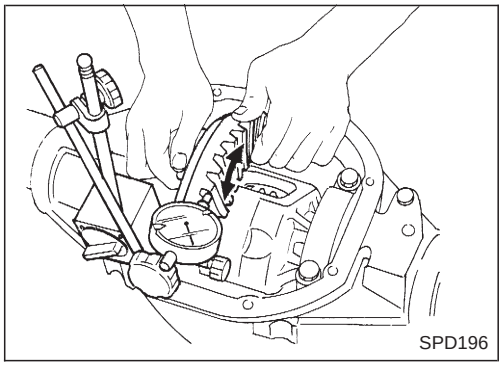


Pre-inspection

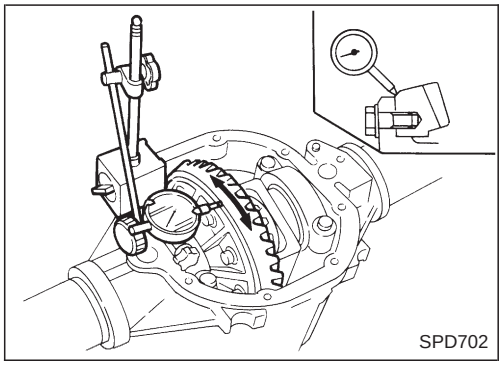
Before disassembling final drive, perform the following inspection.

- Total preload

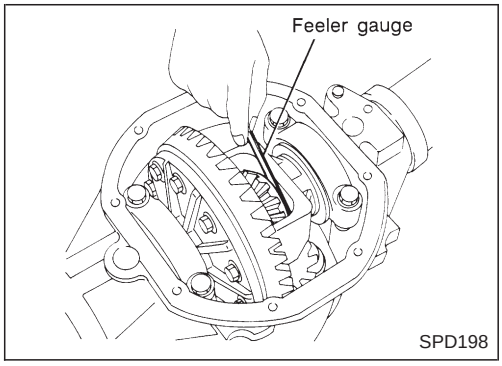
a. Turn drive pinion in both directions several times to set bearing rollers.
b. Check total preload with Tool.
   Tool number: ST3127S000
   Total preload:
   1.2 - 2.3 N·m
   (12 - 23 kg-cm, 10 - 20 in-lb)



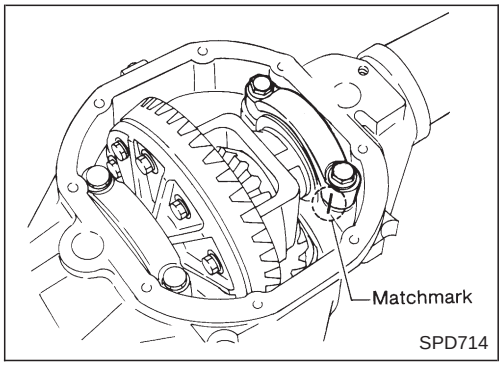
- Ring gear-to-drive pinion backlash.
  Check backlash of ring gear with a dial indicator at several points.
  Ring gear-to-drive pinion backlash:
  0.13 - 0.18 mm (0.0051 - 0.0071 in)



- Ring gear runout
  Check runout of ring gear with a dial indicator.
  Runout limit: 0.05 mm (0.0020 in)



- Tooth contact
  Check tooth contact. Refer to ‘‘ADJUSTMENT’’, PD-49.
- Side gear-to-pinion mate gear backlash
  Measure clearance between side gear thrust washer and differential case with a feeler gauge.
  Clearance between side gear thrust washer and differential case:
  Less than 0.15 mm (0.0059 in)

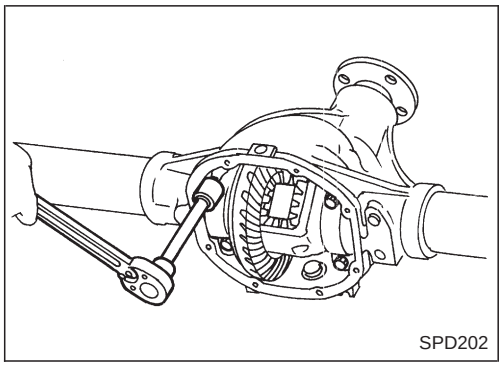


Differential Carrier

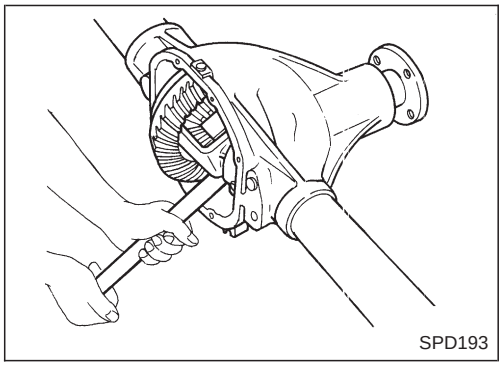
1. Remove rear cover and rear cover gasket.
2. Put match marks on one side of side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

Bearing caps are line-bored during manufacture and should be put back in their original places.

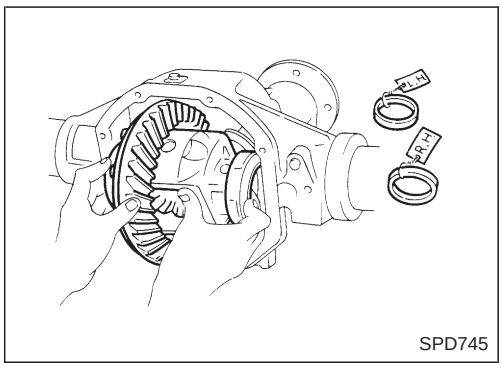
Differential Carrier (Cont'd)


SPD202

3. Remove side bearing caps.

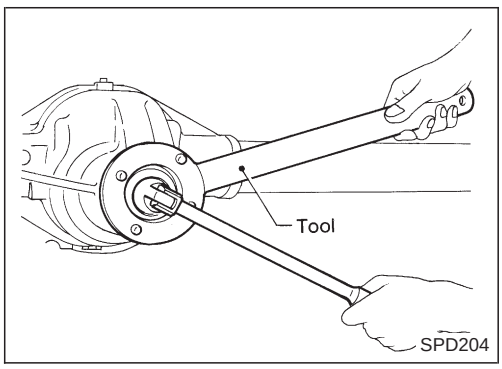

SPD193

4. Remove differential case assembly with pry bar.



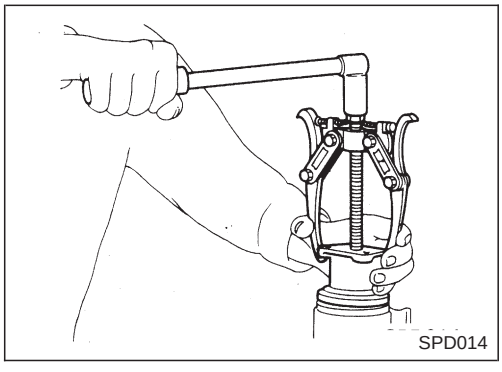
SPD745

Keep the side bearing outer races together with their respective inner cones — do not mix them up.



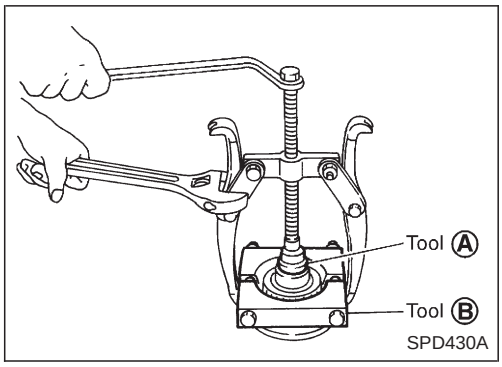
SPD204

5. Remove pinion nut with Tool.
   Tool number: ST38060002

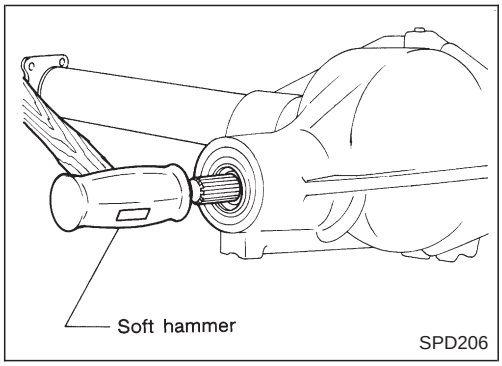

SPD014

6. Remove companion flange with puller.

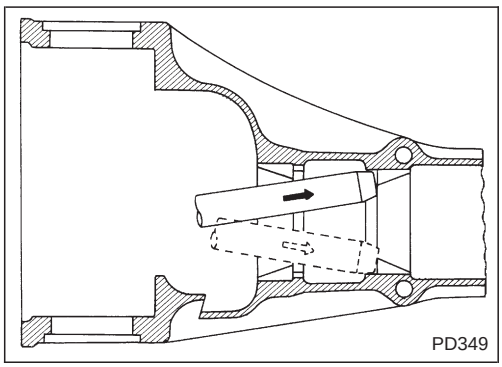
Differential Carrier (Cont'd)



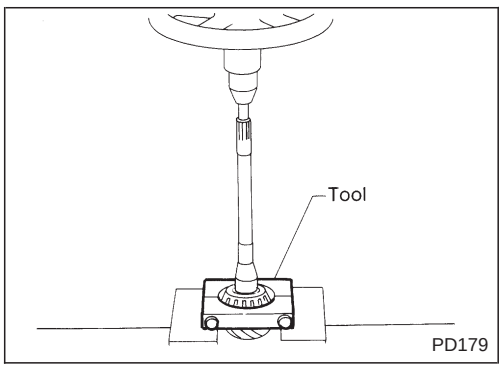
7. Remove sensor rotor with Tools (With ABS models).
   Tool numbers:
   - Ⓐ **ST33061000**
   - Ⓑ **ST30031000**
8. Remove ABS sensor unit.



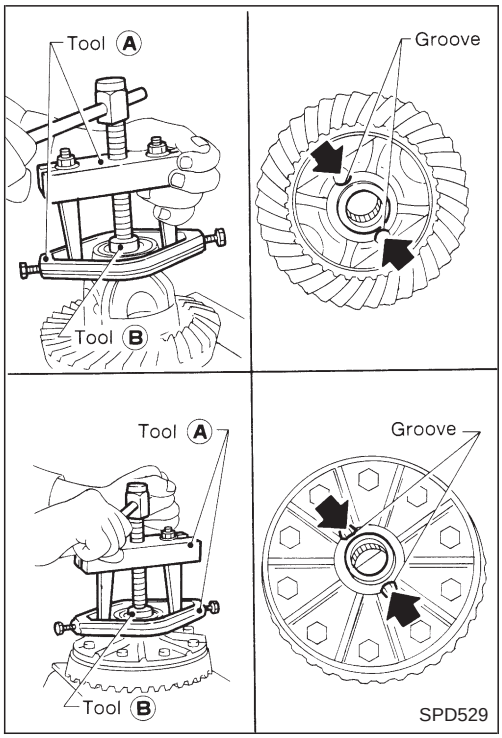
9. Remove drive pinion with soft hammer.
10. Remove front oil seal and pinion front bearing inner cone.



11. Remove pinion bearing outer races with a brass drift.



12. Remove pinion rear bearing inner cone and pinion height adjusting washer.
    Tool number: ST30031000



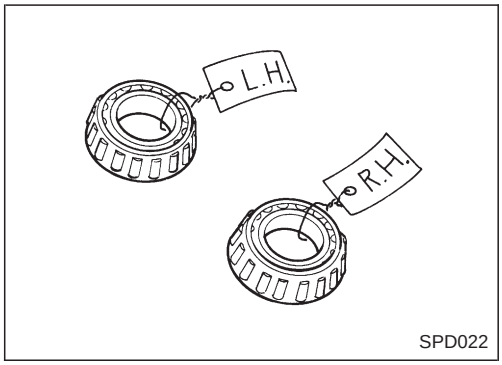
Differential Case

1. Remove side bearing inner cones.

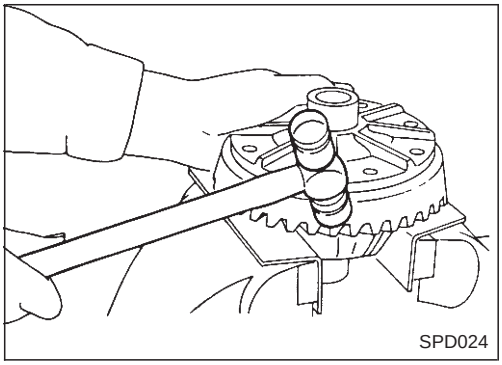
To prevent damage to bearing, engage puller jaws in grooves.

Tool numbers:

Ⓐ ST33051001
Ⓑ ST33061000

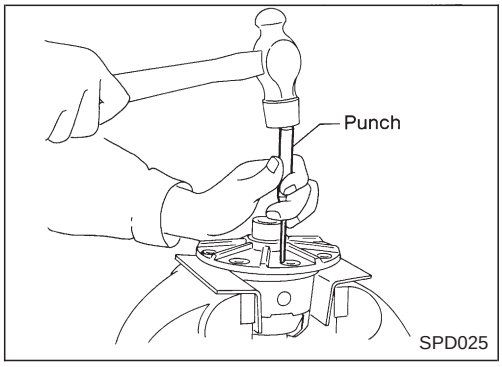


Be careful not to confuse the right and left hand parts.



2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off the differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.

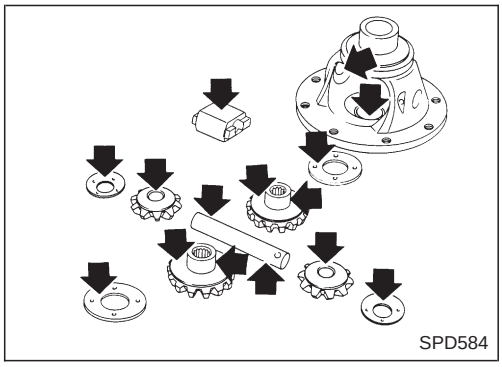


4. Punch off pinion mate shaft lock pin from ring gear side.

Lock pin is calked at pin hole mouth on differential case.

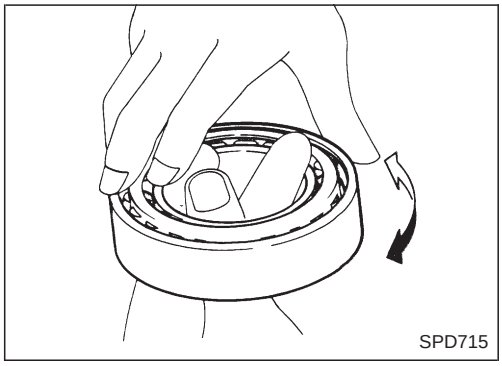
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping. If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).


SPD584

Differential Case Assembly

Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft, thrust block and thrust washers.

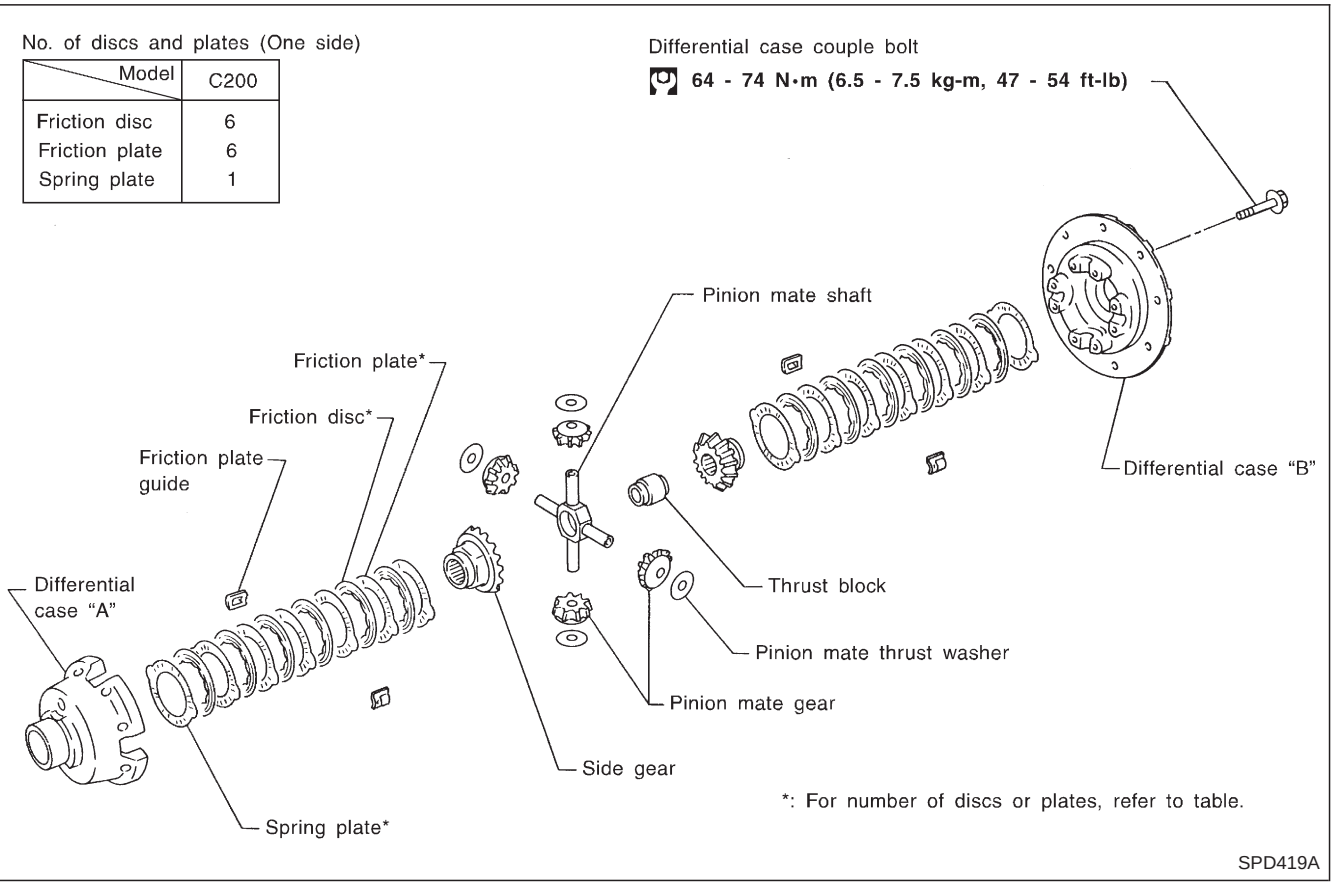

SPD715

Bearing

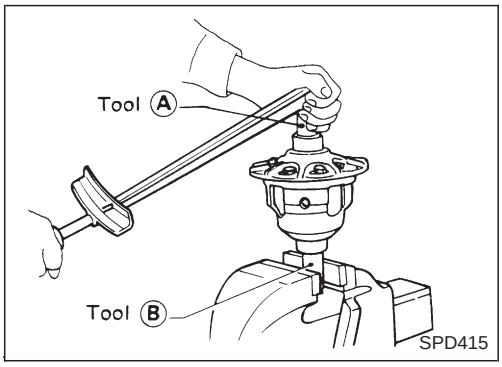
1. Thoroughly clean bearing.
2. Check bearings for wear, scratches, pitting or flaking. Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.

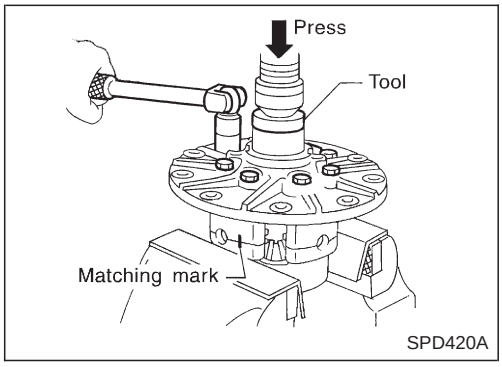
No. of discs and plates (One side)

Model	C200
Friction disc	6
Friction plate	6
Spring plate	1



CAUTION:
Do not run engine when only one wheel (rear) is off the ground.





Preparation for Disassembly

CHECKING DIFFERENTIAL TORQUE

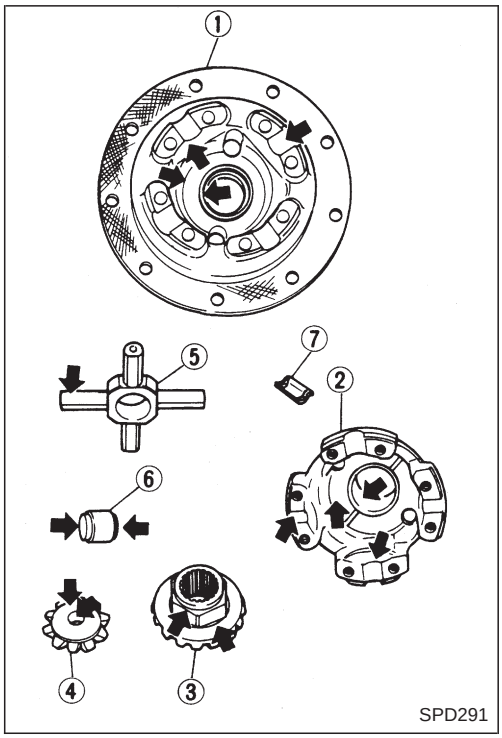
Measure differential torque with Tools.
If it is not within the specifications, inspect components of limited slip differential.

Differential torque:
88 - 108 N·m
(9.0 - 11.0 kg-m, 65 - 80 ft-lb)
Tool numbers:
(A) KV38105110
(B) KV38105120

Disassembly

1. Remove couple bolts using a press.
   Tool number: ST33081000
2. Separate differential cases A and B.
   Draw out component parts (discs and plates, etc.).

Put marks on differential cases so that they can be reinstalled in their original positions.



SPD291

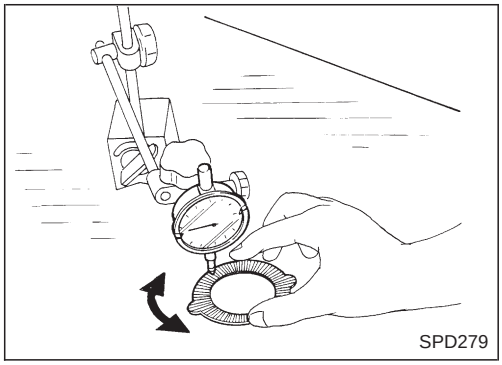
Inspection

CONTACT SURFACES

1. Clean the disassembled parts in suitable solvent and blow dry with compressed air.
2. If the following surfaces are found with burrs or scratches, smooth with oil stone.
   ① Differential case B
   ② Differential case A
   ③ Side gear
   ④ Pinion mate gear
   ⑤ Pinion mate shaft
   ⑥ Thrust block
   ⑦ Friction plate guide

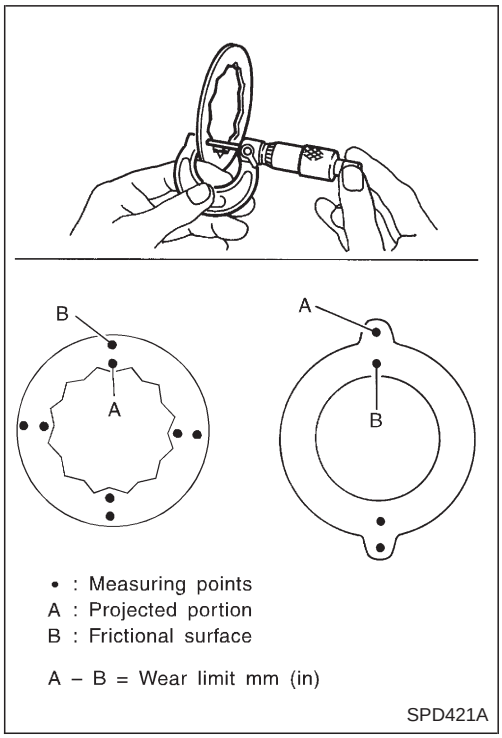
DISC AND PLATE

1. Clean the discs and plates in suitable solvent and blow dry with compressed air.
2. Inspect discs and plates for wear, nicks and burrs.

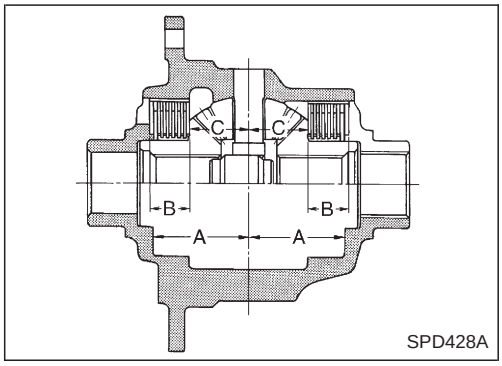

SPD279

3. Check friction discs or plates for warpage.
   Maximum allowable warpage:
   0.08 mm (0.0031 in)
   If it exceeds limits, replace with a new disc or plate to eliminate possibility of clutch slippage or sticking.

Inspection (Cont'd)



4. Measure frictional surfaces and projected portions of friction discs, plates and spring plate. If any part has worn beyond the wear limit, replace it with a new one that is the same thickness as the projected portion.
   Wear limit:
   0.1 mm (0.004 in) or less



Adjustment

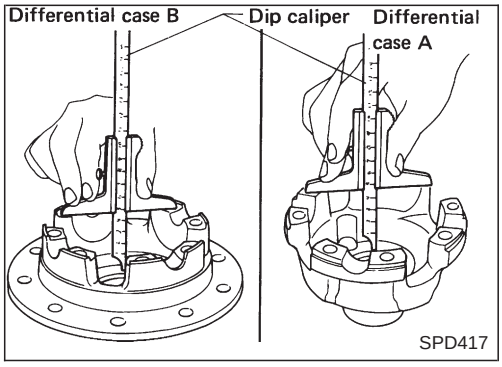
FRICTION DISC AND FRICTION PLATE END PLAY

End play of friction disc and friction plate can be calculated by using the following equation and should be adjusted within the following range.
Adjustment can be made by selecting friction disc having two different thicknesses.

End play E:
0.05 - 0.15 mm (0.0020 - 0.0059 in)

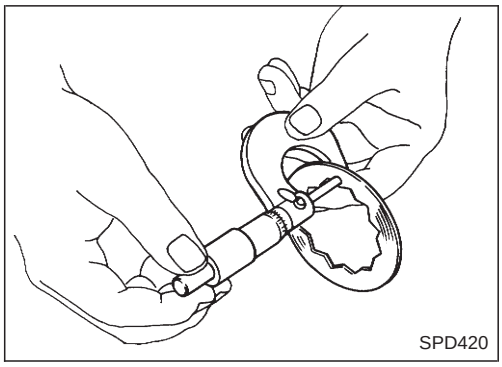
E = A − (B + C)

A: Length of differential case contact surface to differential case inner bottom.
B: Total thickness of friction discs, friction plates and spring plate in differential case on one side.
C: Length of differential case contact surface to back side of side gear.

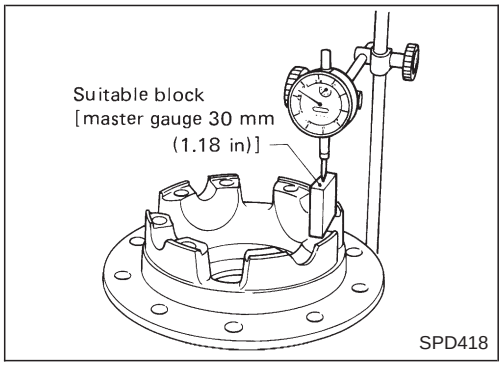


1. Measure values of ''A''.
   Standard length A:
   49.50 - 49.55 mm (1.9488 - 1.9508 in)

Adjustment (Cont'd)


SPD420

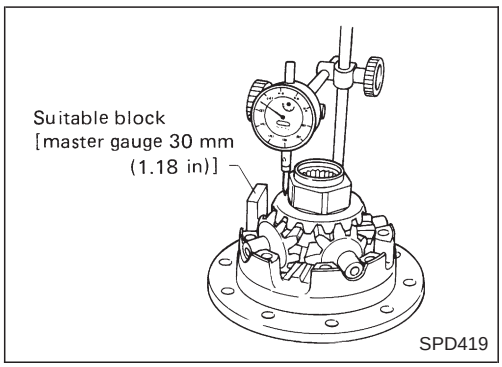
2. Measure thickness of each disc and plate.
   Total thickness "B":
   19.24 - 20.36 mm (0.7575 - 0.8016 in)
   No. of discs and plates (One side):
   Friction disc 6
   Friction plate 6
   Spring plate 1



SPD418

3. Measure values of "C".
a. Attach a dial indicator to the base plate.
b. Place differential case B on the base plate, and install a master gauge on case B.

Then adjust the dial indicator scale to zero with its tip on the master gauge.



SPD419

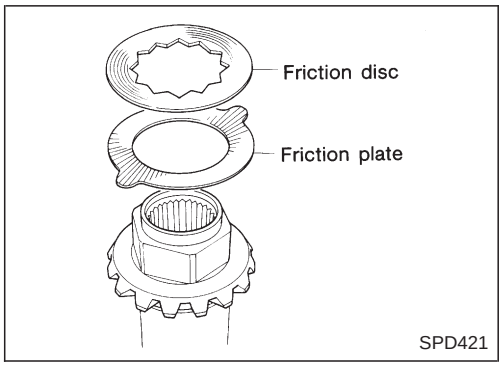
c. Install pinion mate gears, side gears and pinion mate shaft in differential case B.
d. Set dial indicator's tip on the side gear, and read the indication.

Example:

E = A − D
= A − (B + C)
= 0.05 to 0.15 mm
A = 49.52 mm
B = 19.45 mm
C = 29.7 mm
D = B + C
B ... 19.45
+ C ... 29.7
49.15

E = A − D
A ... 49.52
−D ... 49.15
0.37

From the above equation, end play of 0.37 mm exceeds the specified range of 0.05 to 0.15 mm.
Select suitable discs and plates to adjust correctly.

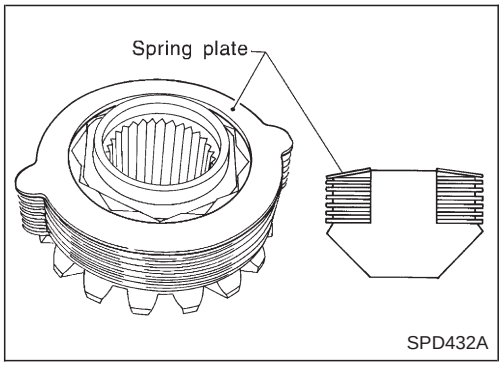


Assembly

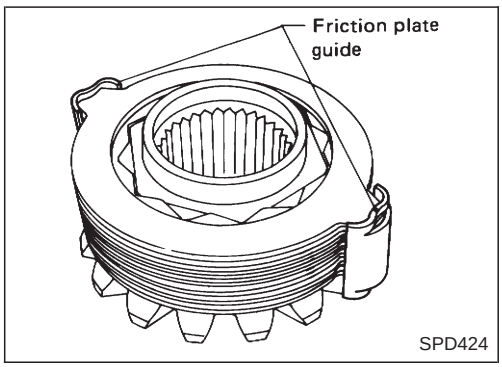
Prior to assembling discs and plates, properly lubricate them by dipping them in limited slip differential oil.

1. Alternately position specified number of friction plates and friction discs on rear of side gear.

Always position a friction plate first on rear of side gear.

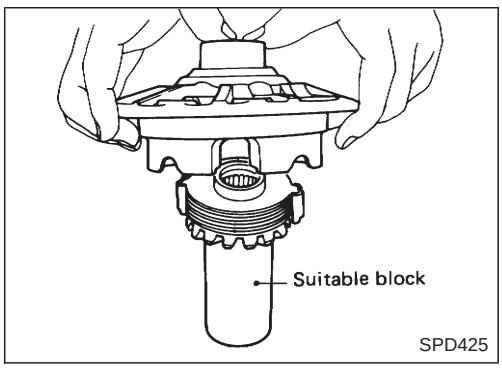


2. Install spring plate.



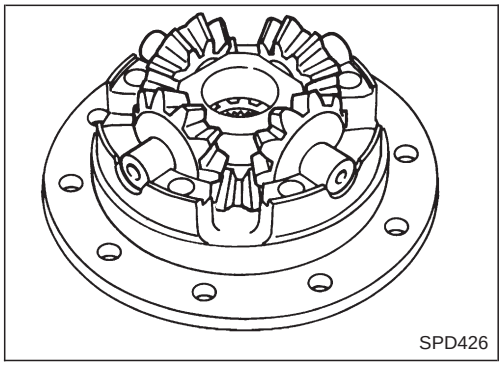
3. Install friction plate guides.

Correctly align the raised portions of friction plates, and apply grease to inner surfaces of friction plate guides to prevent them from falling.



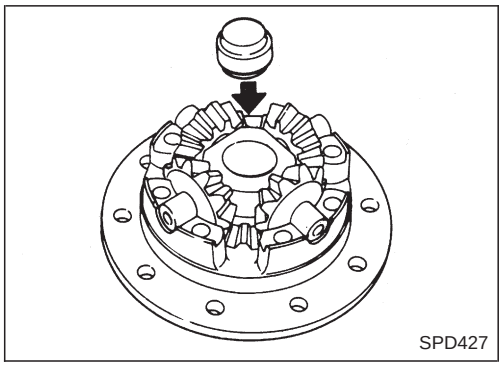
4. Install differential case B over side gear, discs, plates and friction plate guide assembly.

- **Install differential case B while supporting friction plate guides with your middle finger by inserting through oil hole in differential case.**
- **Be careful not to detach spring plate from the hexagonal part of the side gear.**

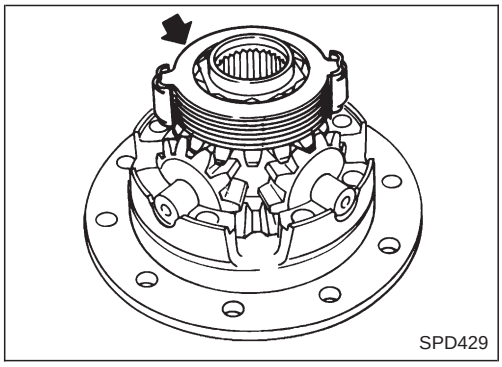


5. Install pinion mate gears and pinion shaft to differential case B.

Assembly (Cont'd)

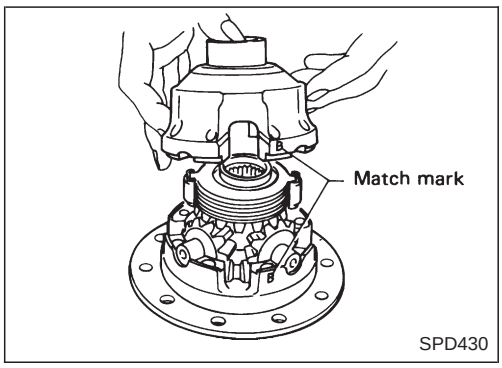

SPD427

6. Install thrust block.


SPD429

7. Install side gear to pinion mate gears.
8. Install each disc and plate.

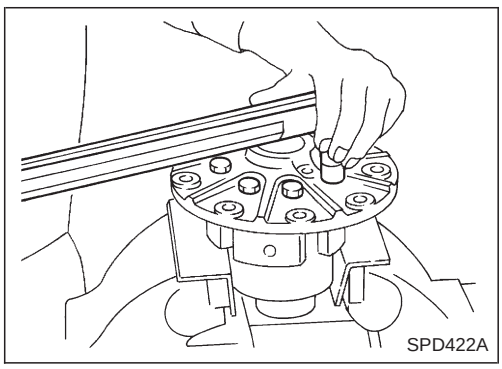
Use same procedures as outlined in steps 1. through 3.



SPD430

9. Install differential case A.

Position differential cases A and B by correctly aligning marks stamped on cases.


SPD422A

10. Tighten differential case bolts.
11. Place ring gear on differential case and install new bolts.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

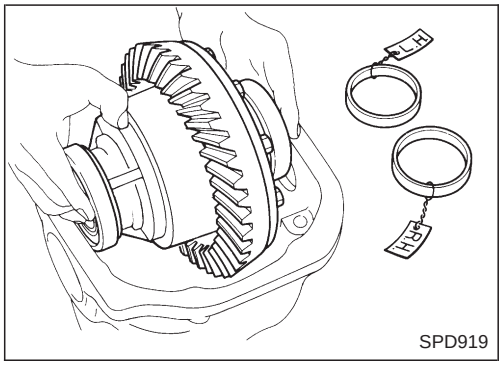
12. Install side bearing inner cone.
13. Check differential torque.

For quiet and reliable final drive operation, the following five adjustments must be made correctly.

1. Side bearing preload
2. Pinion gear height
3. Pinion bearing preload. Refer to ''ASSEMBLY'', PD-53.
4. Ring gear-to-pinion backlash. Refer to ''ASSEMBLY'', PD-54.
5. Ring and pinion gear tooth contact pattern

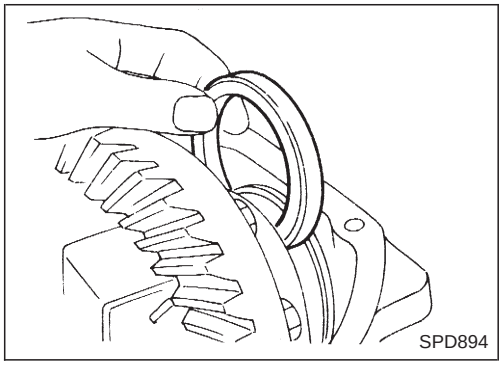
Side Bearing Preload

A selection of carrier side bearing preload shims is required for successful completion of this procedure.



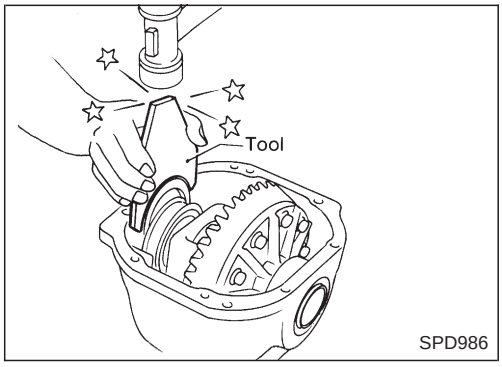
SPD919

1. Make sure all parts are clean. Make sure, also, the bearings are well lubricated with light oil or type ''DEXRON™'' automatic transmission fluid.
2. Place the differential carrier, with side bearings and bearing races installed, into the final drive housing.


SPD894

3. Put the side bearing spacer in place.

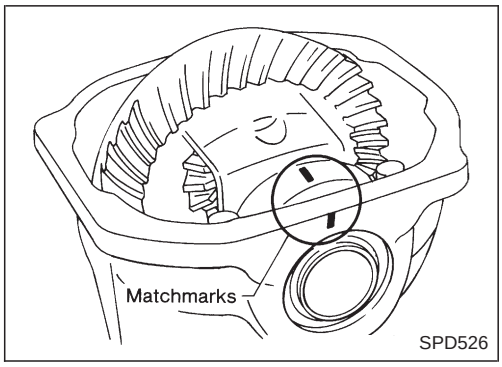
CAUTION:
Side bearing spacer is placed on either the right or left depending upon final drive gear ratio. Be sure to replace it on the correct side.



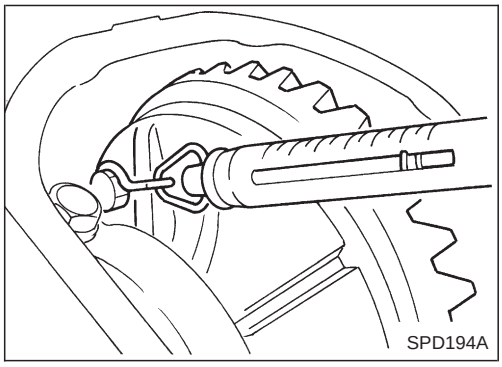
SPD986

4. Use Tool to place original carrier side bearing preload shims on the carrier end, opposite the ring gear.
   Tool number: KV38100600

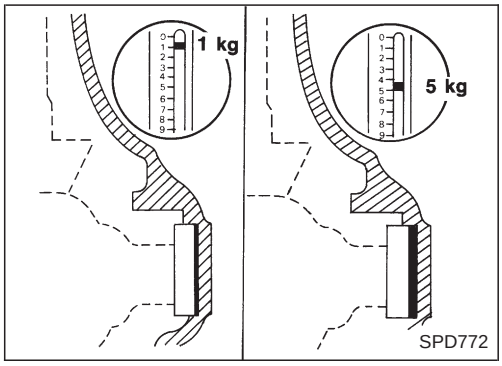
Side Bearing Preload (Cont'd)



5. Install the side bearing caps in their correct locations and torque the bearing cap retaining bolts.
   Specification:
   88 - 98 N·m
   (9.0 - 10.0 kg-m, 65 - 72 ft-lb)
6. Turn the carrier several times to seat the bearings.

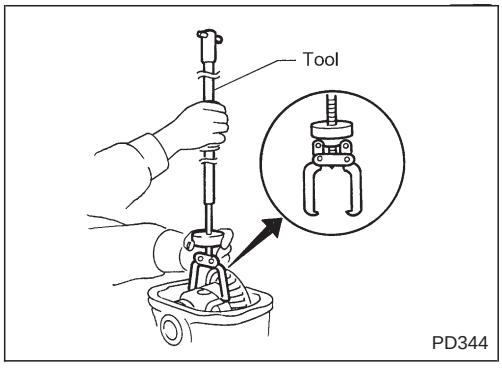


7. Measure the turning torque of the carrier at the ring gear retaining bolts with a spring gauge.
   Specification:
   34.3 - 39.2 N
   (3.5 - 4.0 kg, 7.7 - 8.8 lb)
   of pulling force at the ring gear bolt

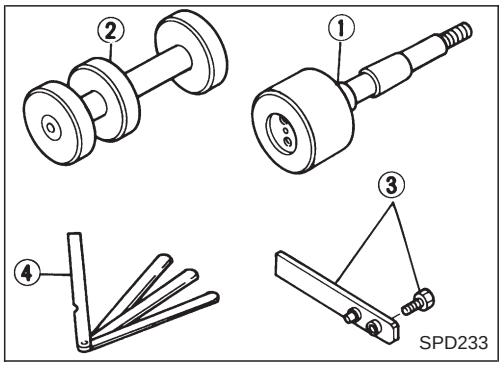


8. If the turning torque is not within the specifications, correct the torque as follows:
- If the turning torque is less than the specified range, install washers of greater thickness.
- If the turning torque is greater than the specification, install thinner washers.
- See the SDS section for washer dimensions and part numbers.

9. Record the total amount of washer thickness required for the correct carrier side bearing preload.



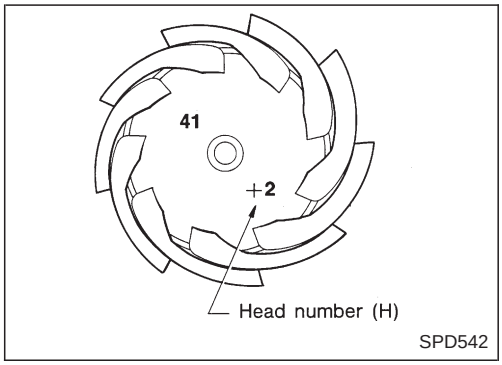
10. Remove the carrier from the final drive housing. Save the selected preload washers for later use during the assembly of the final drive unit.



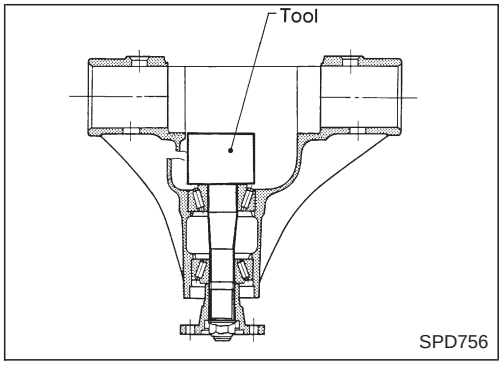
Drive Pinion Height

1. Prepare Tools for pinion height adjustment.
   ① Dummy Shaft (KV38103910)
   ② Height Gauge (KV38100120)
   ③ Stopper (KV38100140)
   ④ Feeler Gauge
2. To simplify the job, make a chart, like the one below, to organize your calculations.

LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
N: Measuring clearance	

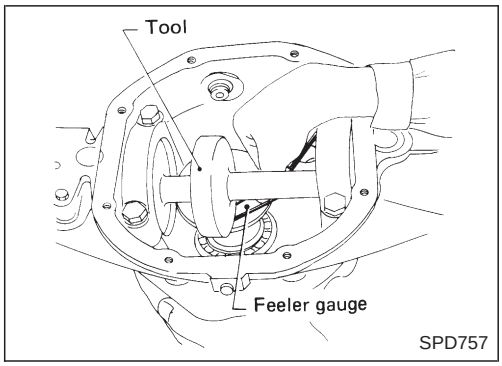


3. Write the following numbers down the chart.
   H: Head number



4. Set Tool (Dummy shaft) as shown at left and tighten drive pinion nut carefully to correct preload of 1.0 to 1.3 N·m (10 to 13 kg-cm, 8.7 to 11.3 in-lb).
   Tool number: KV38103910

Drive Pinion Height (Cont'd)



5. Attach Tool (Height gauge) to gear carrier, and measure the clearance "N" between the height gauge and the dummy shaft face.
   Tool number: KV38100120
6. Substitute these values into the equation to calculate the thickness of the washer.

If value signifying H is not given, regard it as zero and calculate.

T (Thickness of washer) = N − (H x 0.01) + 3.00

Example:

N = 0.23
H = 1

T = N − (H x 0.01) + 3.00 = 0.23 − (1 x 0.01) + 3.00

(1) H 1
x 0.01

+0.01

(2) N 0.23
− (+0.01)

0.22

(3) 0.22
+3.00

3.22

∴T = 3.22

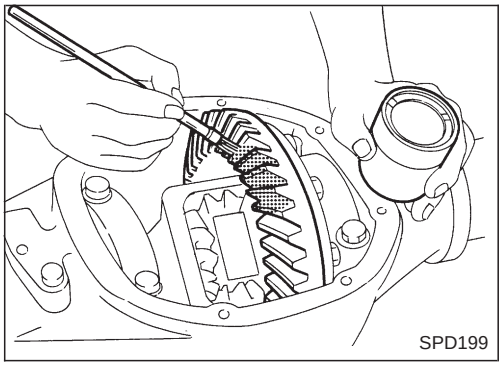
7. Select the proper washer. (Refer to SDS.)

If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

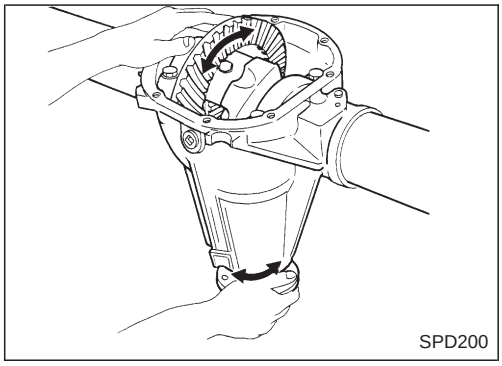
Example:
Calculated value ... T = 3.22 mm
Used washer ... T = 3.21 mm

Tooth Contact

Checking gear tooth contact pattern is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear set which is not positioned properly may be noisy, or have short life or both. With the checking or gear tooth contact pattern, the most desirable contact for low noise level and long life can be assured.

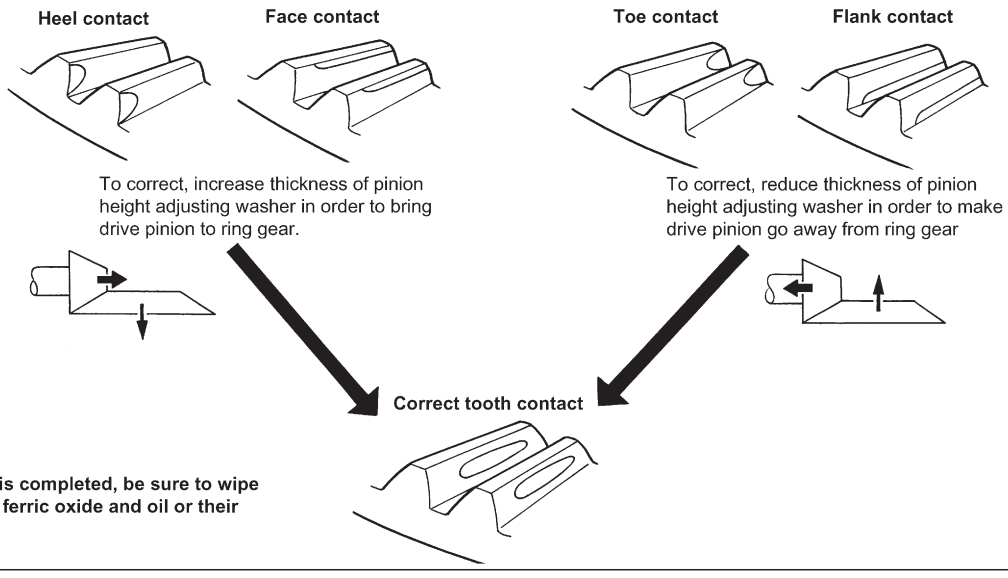

SPD199

1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.


SPD200

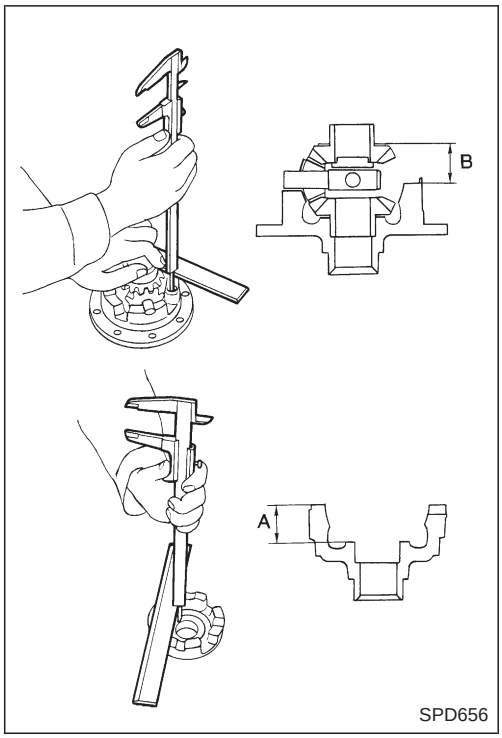
3. Hold companion flange steady and rotate the ring gear in both directions.

Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
The tooth pattern is the best indication of how well a differential has been set up.



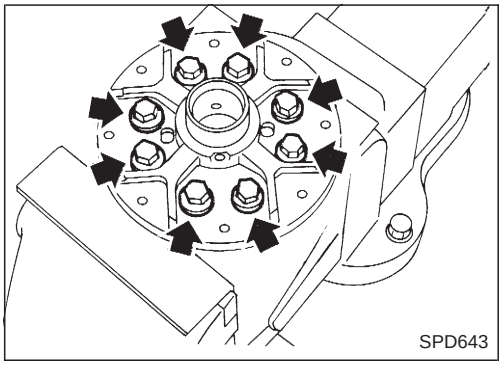
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SPD007

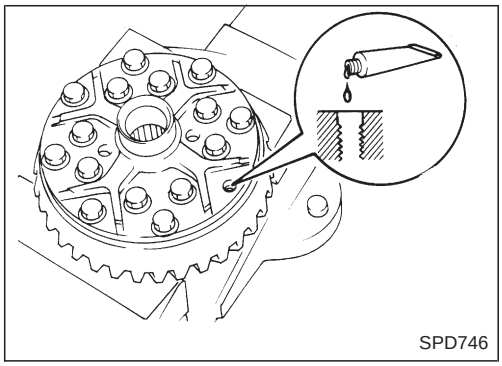


Differential Case

1. Measure clearance between side gear thrust washer and differential case.
   Clearance between side gear thrust washer and differential case (A − B):
   Less than 0.15 mm (0.0059 in)
   The clearance can be adjusted with side gear thrust washer. Refer to SDS, PD-79.
2. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see they turn properly.

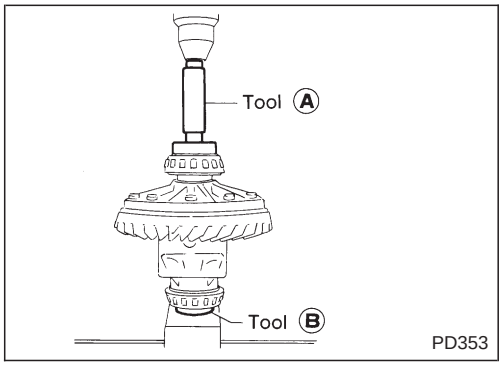


3. Install differential case LH and RH.

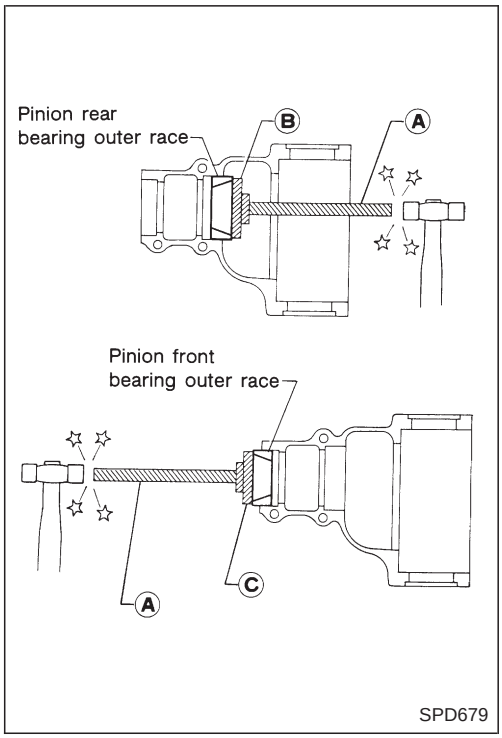


4. Place differential case on ring gear.
5. Apply locking agent [Locktite (stud lock) or equivalent] to ring gear bolts, and install them.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

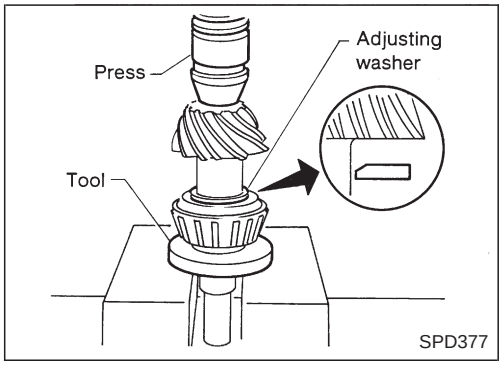


6. Press-fit side bearing inner cones on differential case with Tool.
   Tool numbers:
   (A) ST33230000
   (B) ST33081000

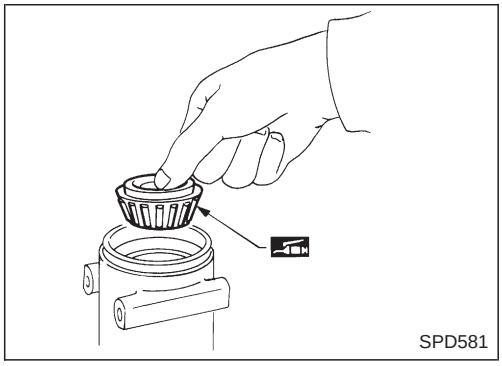


Differential Carrier

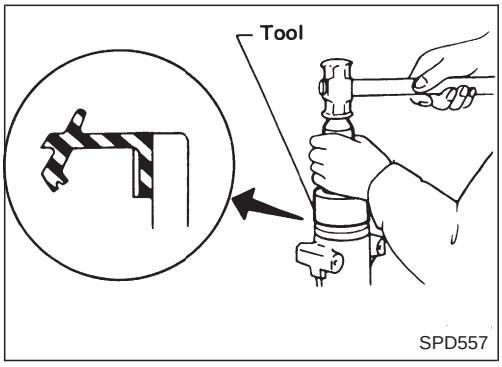
1. Press-fit front and rear bearing outer races with Tools.
   Tool numbers:
   - Ⓐ **ST30611000**
   - Ⓑ **ST30621000**
   - Ⓒ **ST30613000**



2. Select pinion height adjusting washer. Refer to ‘‘ADJUSTMENT’’, PD-47.
3. Install pinion height adjusting washer in drive pinion, and press-fit rear bearing inner cone in it, with press and Tool.
   Tool number: ST30901000

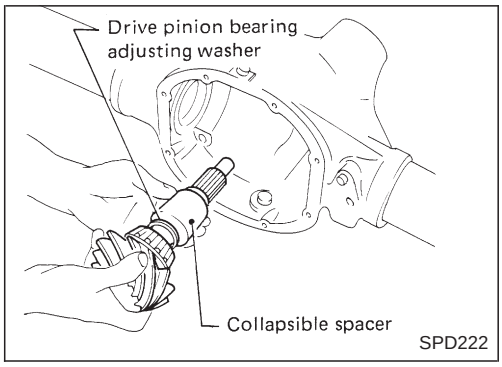


4. Place pinion front bearing inner cone in gear carrier.

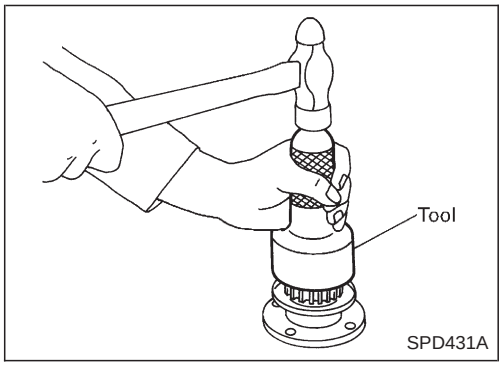


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.
   Tool number: KV38100500

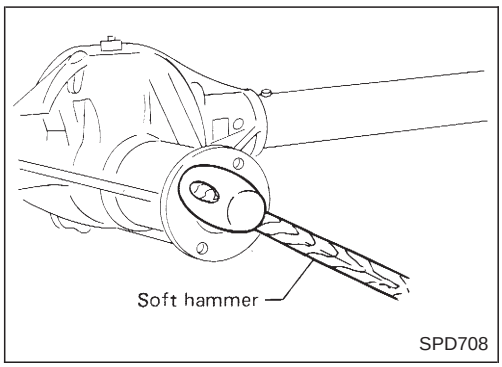
Differential Carrier (Cont'd)



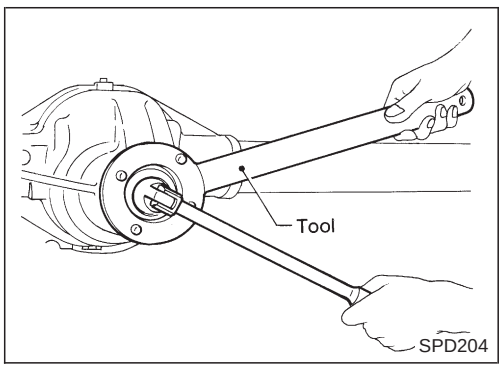
6. Place drive pinion bearing spacer, drive pinion bearing adjusting washer and drive pinion in gear carrier.



7. Insert sensor rotor into companion flange with Tool.
   Tool number: ST30720000
8. Install ABS sensor unit on gear carrier.

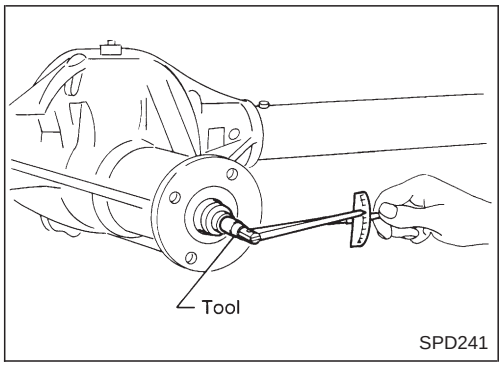


9. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.



10. Tighten pinion nut to 127 N·m (13 kg-m, 94 ft-lb).
The threaded portion of drive pinion and pinion nut should be free from oil or grease.
Tool number: ST38060002

Differential Carrier (Cont'd)

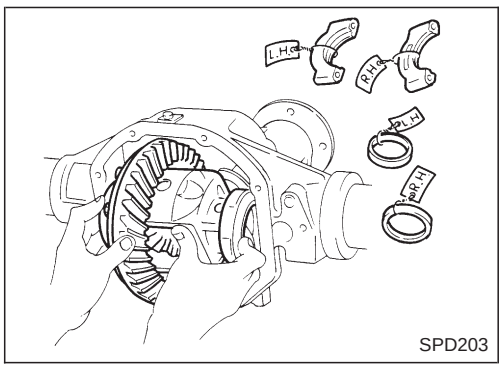


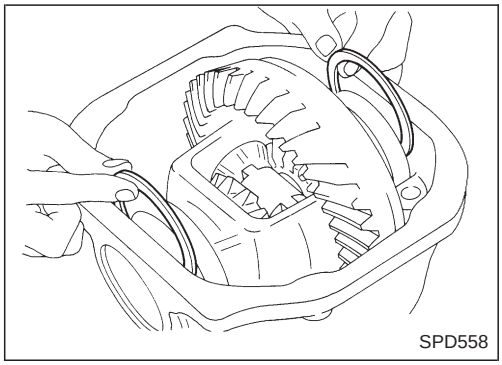
11. Tighten the pinion nut by very small degrees until the specified preload is achieved. When checking the preload, turn the drive pinion in both directions several times to set the bearing rollers.
    Tool number: ST3127S000
    Pinion bearing preload (With front oil seal):
    1.1 - 1.7 N·m
    (11 - 17 kg-cm, 9.5 - 14.8 in-lb)
    Pinion bearing preload (Without front oil seal):
    1.0 - 1.6 N·m
    (10 - 16 kg-cm, 8.7 - 13.9 in-lb)

This procedure will have to be repeated if:

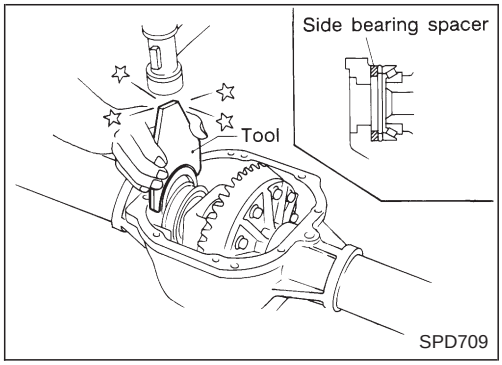
- **Maximum preload is achieved before the minimum pinion nut torque is reached.**
- **Minimum preload is not achieved before maximum pinion nut torque is reached.**

12. Select side bearing adjusting washer.
    Refer to Adjustment.
13. Install differential case assembly with side bearing outer races into gear carrier.

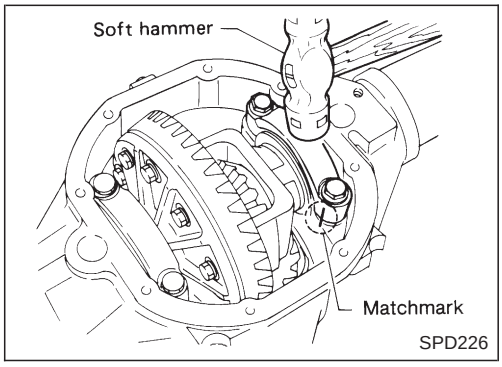




14. Insert left and right side bearing adjusting washers in place between side bearing and carrier.

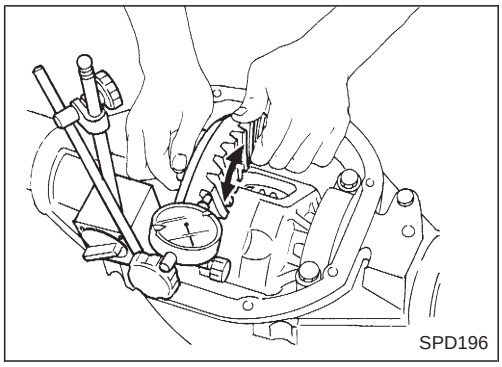


15. Drive in side bearing spacer with Tool.
    Tool number: KV38100600



16. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.

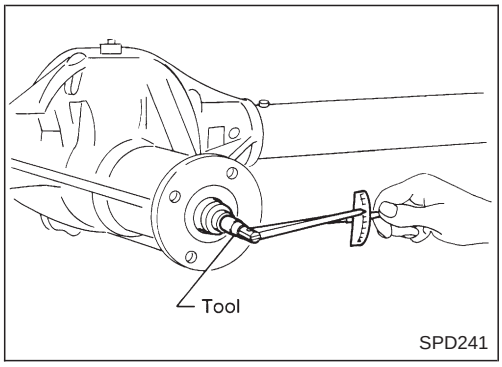
Differential Carrier (Cont'd)


SPD196

17. Measure ring gear-to-drive pinion backlash with a dial indicator.
    Ring gear-to-drive pinion backlash:
    0.13 - 0.18 mm
    (0.0051 - 0.0071 in)

- If backlash is too small, decrease thickness of right shim and increase thickness of left shim by the same amount.
  If backlash is too great, reverse the above procedure.

Never change the total amount of shims as it will change the bearing preload.

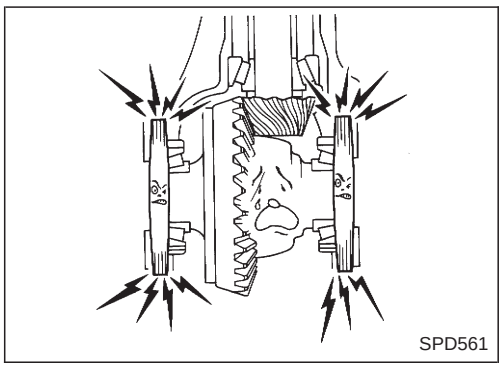


SPD241

18. Check total preload with Tool.

When checking preload, turn drive pinion in both directions several times to seat bearing rollers correctly.

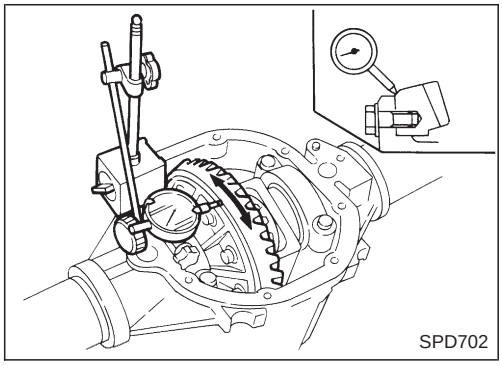
Total preload:
1.2 - 2.3 N·m
(12 - 23 kg-cm, 10 - 20 in-lb)
Tool number: ST3127S000


SPD561

- If preload is too great, remove the same amount of shim from each side.
- If preload is too small, add the same amount of shim to each side.

Never add or remove a different number of shims for each side as it will change ring gear-to-drive pinion backlash.

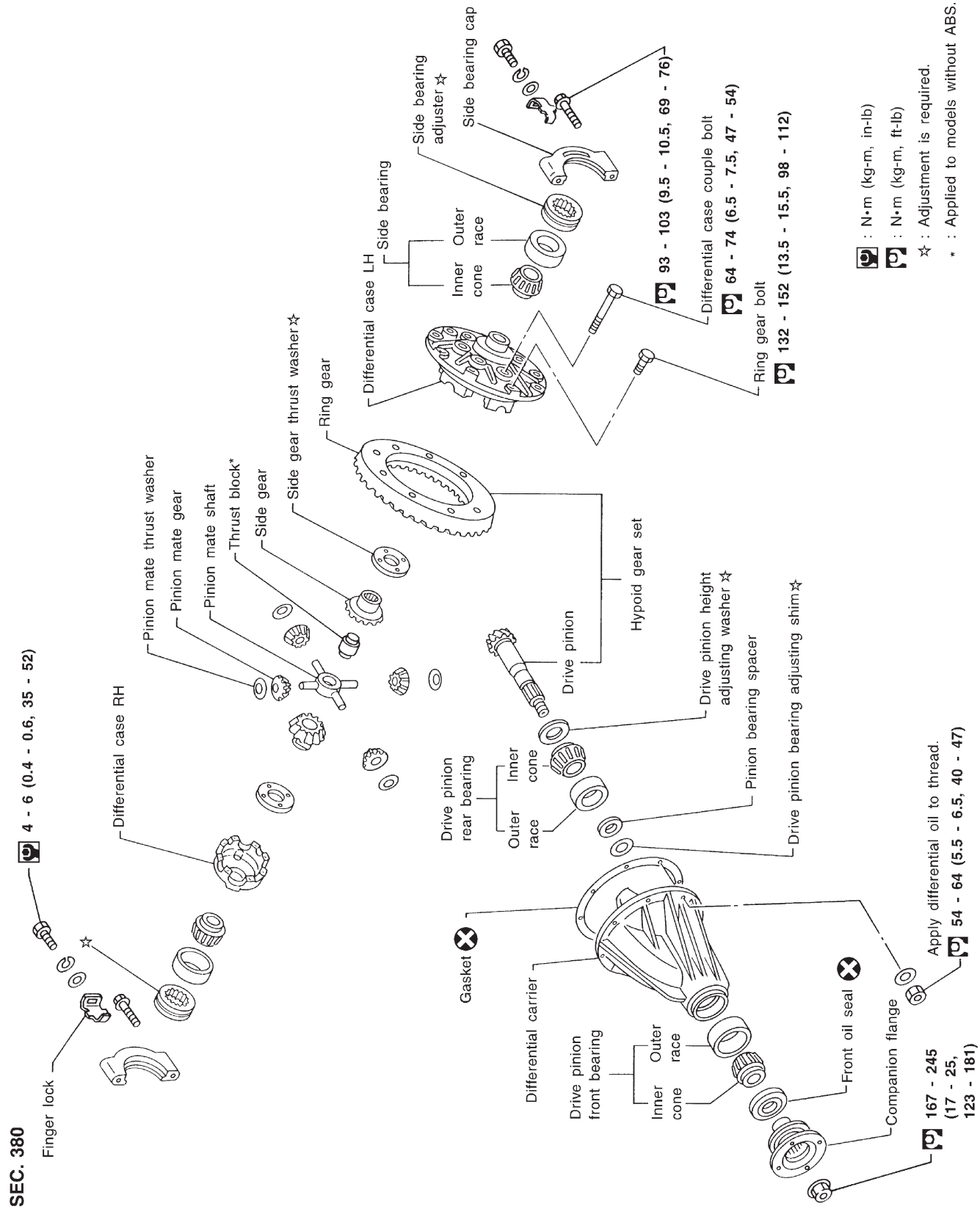
19. Recheck ring gear-to-drive pinion backlash because increase or decrease in thickness of shims will cause change of ring gear-to-pinion backlash.


SPD702

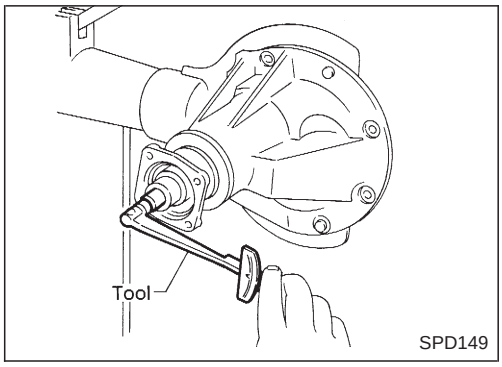
20. Check runout of ring gear with a dial indicator.
    Runout limit:
    0.05 mm (0.0020 in)

- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.
- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.

21. Check tooth contact.
    Refer to ''ADJUSTMENT'', PD-49.
22. Install rear cover and gasket.


SEC. 380
Finger lock
4 - 6 (0.4 - 0.6, 35 - 52)
Differential case RH
Pinion mate thrust washer
Pinion mate gear
Pinion mate shaft
Thrust block*
Side gear
Side gear thrust washer☆
Ring gear
Differential case LH
Side bearing
Inner cone
Outer race
Side bearing adjuster☆
Side bearing cap
93 - 103 (9.5 - 10.5, 69 - 76)
Differential case couple bolt
64 - 74 (6.5 - 7.5, 47 - 54)
Ring gear bolt
132 - 152 (13.5 - 15.5, 98 - 112)
Hypoid gear set
Drive pinion
Drive pinion height adjusting washer☆
Drive pinion rear bearing
Inner cone
Outer race
Pinion bearing spacer
Drive pinion bearing adjusting shim☆
Gasket
Differential carrier
Drive pinion front bearing
Inner cone
Outer race
Front oil seal
Companion flange
Apply differential oil to thread.
54 - 64 (5.5 - 6.5, 40 - 47)
167 - 245 (17 - 25, 123 - 181)
: N·m (kg-m, in-lb)
: N·m (kg-m, ft-lb)
☆ : Adjustment is required.
* : Applied to models without ABS.

SPD427A



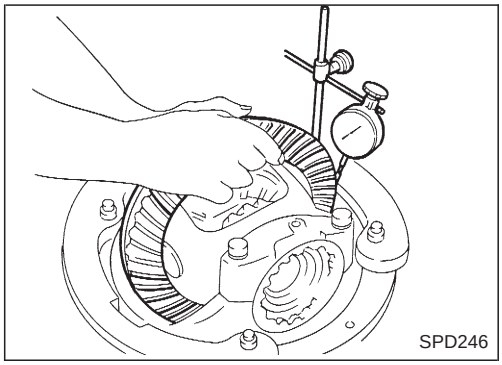
Pre-inspection

Before disassembling final drive, perform the following inspection.

- Total preload

a. Turn drive pinion in both directions several times to seat bearing rollers correctly.
b. Check total preload with Tool.

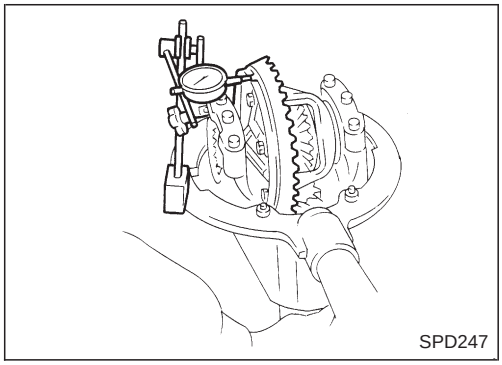
Total preload (With front oil seal):
Drive pinion bearing
New: 1.5 - 1.7 N·m (15 - 17 kg-cm, 13 - 15 in-lb)
Old: 1.7 - 2.5 N·m (17 - 25 kg-cm, 15 - 22 in-lb)
Tool number: ST3127S000



- Ring gear-to-drive pinion backlash

Check backlash of ring gear with a dial indicator at several points.

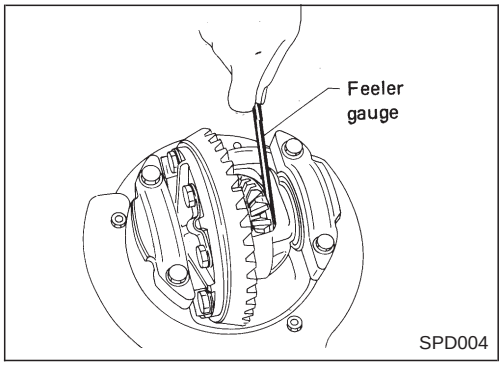
Ring gear-to-drive pinion backlash:
0.13 - 0.18 mm (0.0051 - 0.0071 in)



- Ring gear runout

Check runout of ring gear with a dial indicator.

Runout limit:
0.08 mm (0.0031 in)



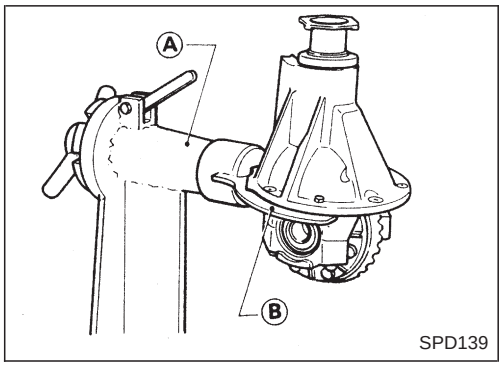
- Tooth contact

Check tooth contact, referring to ‘‘ADJUSTMENT’’, PD-70.

- Side gear-to-pinion mate gear backlash

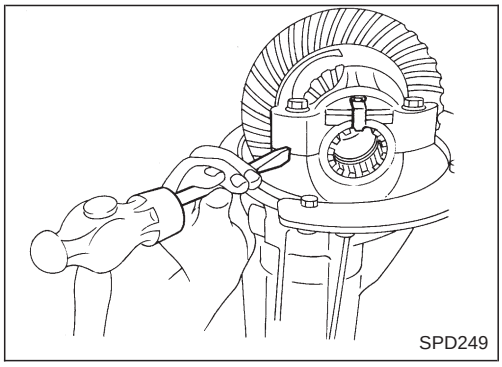
Measure clearance between side gear thrust washer and differential case with a feeler gauge.

Clearance between side gear thrust washer and differential case:
0.1 - 0.2 mm (0.004 - 0.008)



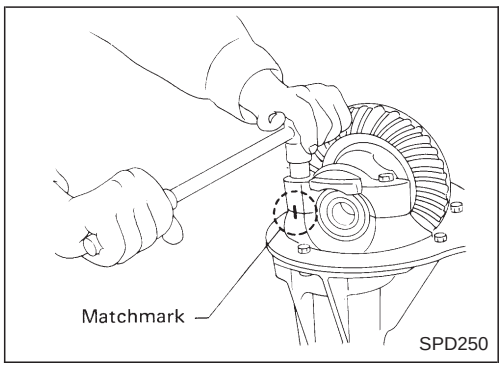
Differential Carrier

1. Mount final drive assembly on Tool.
   Tool numbers:
   - Ⓐ **ST0501S000**
   - Ⓑ **ST06340000**

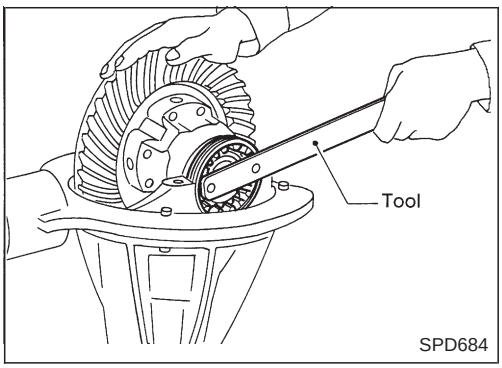


2. Put match marks on one side of side bearing cap with paint or punch to ensure that it is replaced in proper position during reassembly.

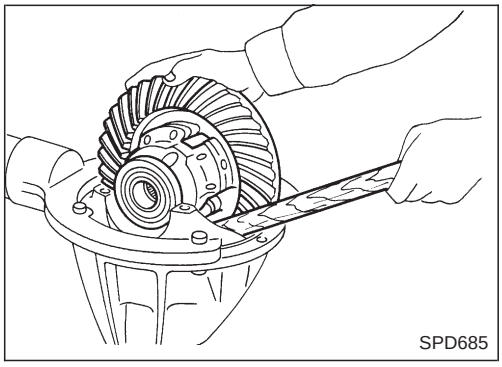
Bearing caps are line-bored during manufacture and should be put back in their original places.



3. Remove side lock fingers and side bearing caps.

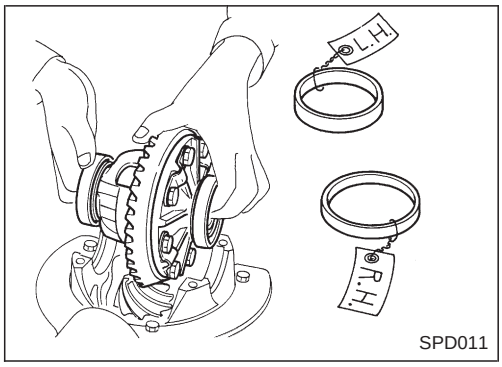


4. Remove side bearing adjuster with Tool.
   Tool number: ST32580000



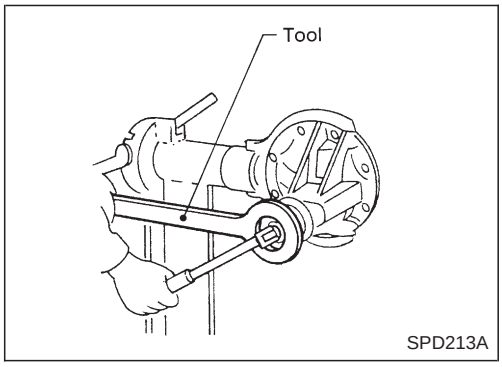
5. Remove differential case assembly with a pry bar.

Differential Carrier (Cont'd)



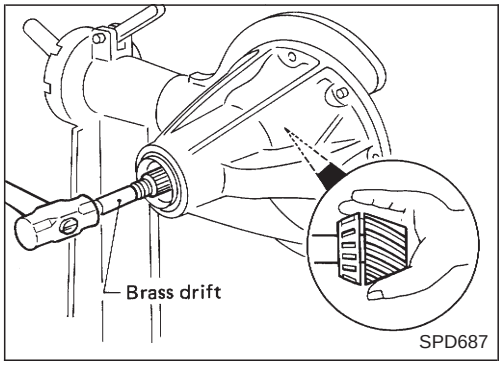
SPD011

Keep the side bearing outer races together with their respective inner cones — do not mix them up.



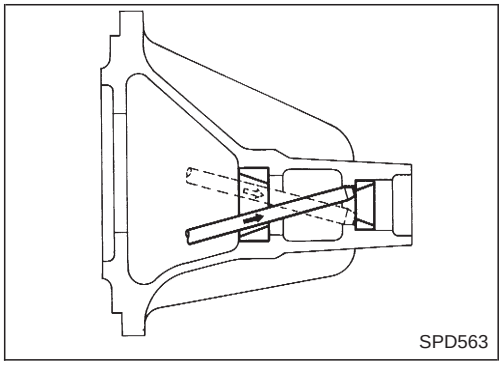
SPD213A

6. Remove drive pinion nut with Tool.
   Tool number: KV38104700
7. Remove companion flange with puller.
8. Remove ABS sensor.

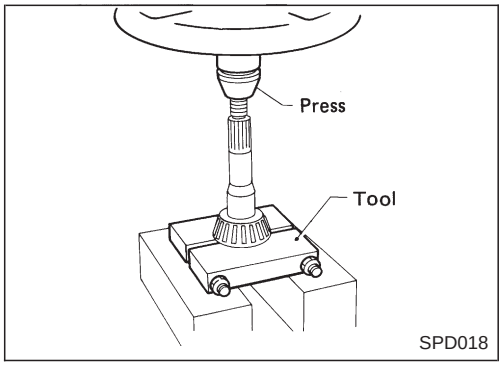


SPD687

9. Take out drive pinion together with pinion rear bearing inner cone, drive pinion bearing spacer and pinion bearing adjusting shim.

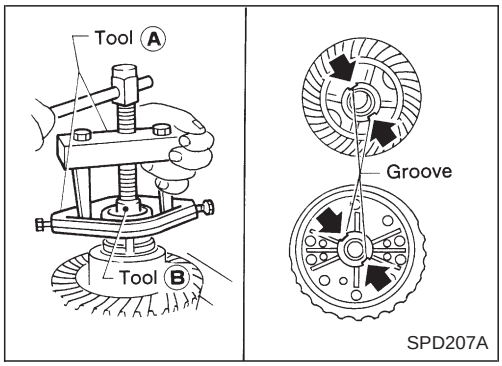

SPD563

10. Remove front oil seal and pinion front bearing inner cone.
11. Remove pinion bearing outer races with a brass drift.



SPD018

12. Remove pinion rear bearing inner cone and drive pinion adjusting washer.
    Tool number: ST30031000



Differential Case

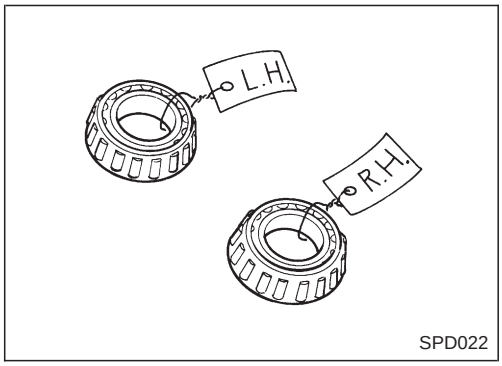
1. Remove side bearing inner cones.

To prevent damage to bearing, engage puller jaws in groove.

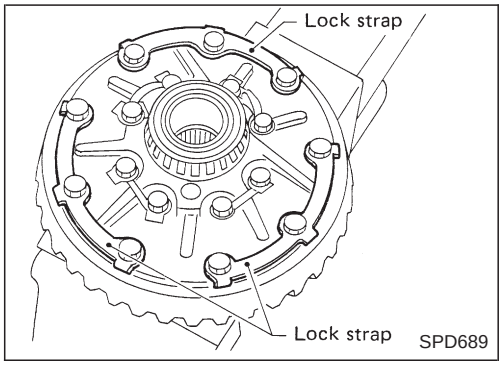
Tool numbers:

(A) ST33051001

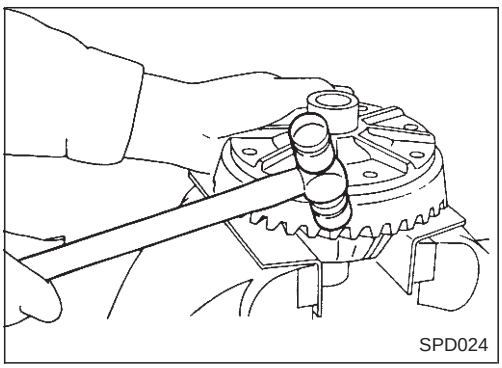
(B) ST33061000



Be careful not to confuse the left and right hand parts.

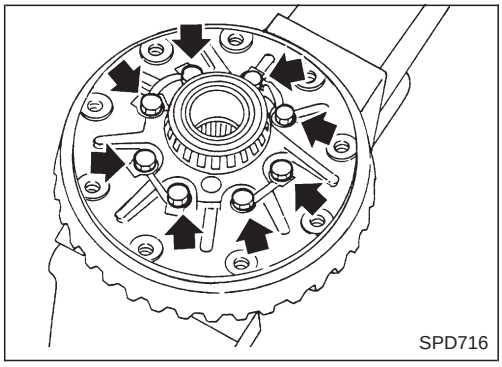


2. Spread out lock straps and loosen ring gear bolts in a criss-cross fashion.



3. Tap ring gear off differential case with a soft hammer.

Tap evenly all around to keep ring gear from binding.

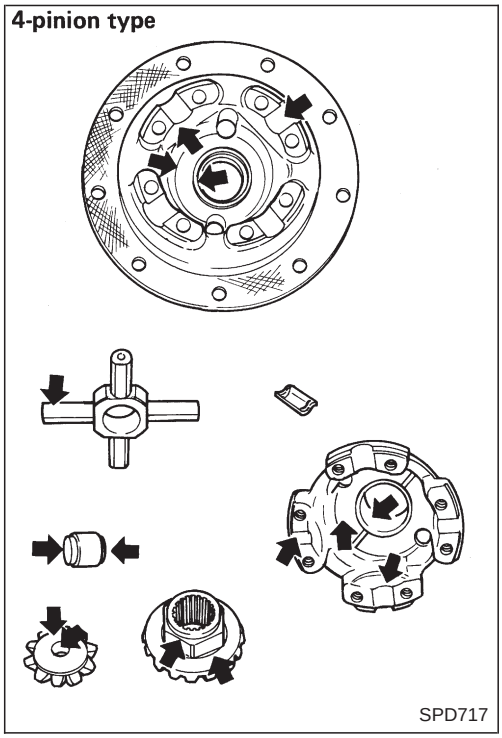


4. Separate differential case LH and RH.

Put match marks on both differential case LH and RH sides prior to separating them.

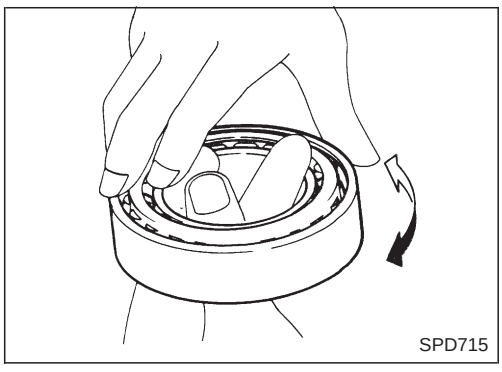
Ring Gear and Drive Pinion

Check gear teeth for scoring, cracking or chipping.
If any damaged part is evident, replace ring gear and drive pinion as a set (hypoid gear set).



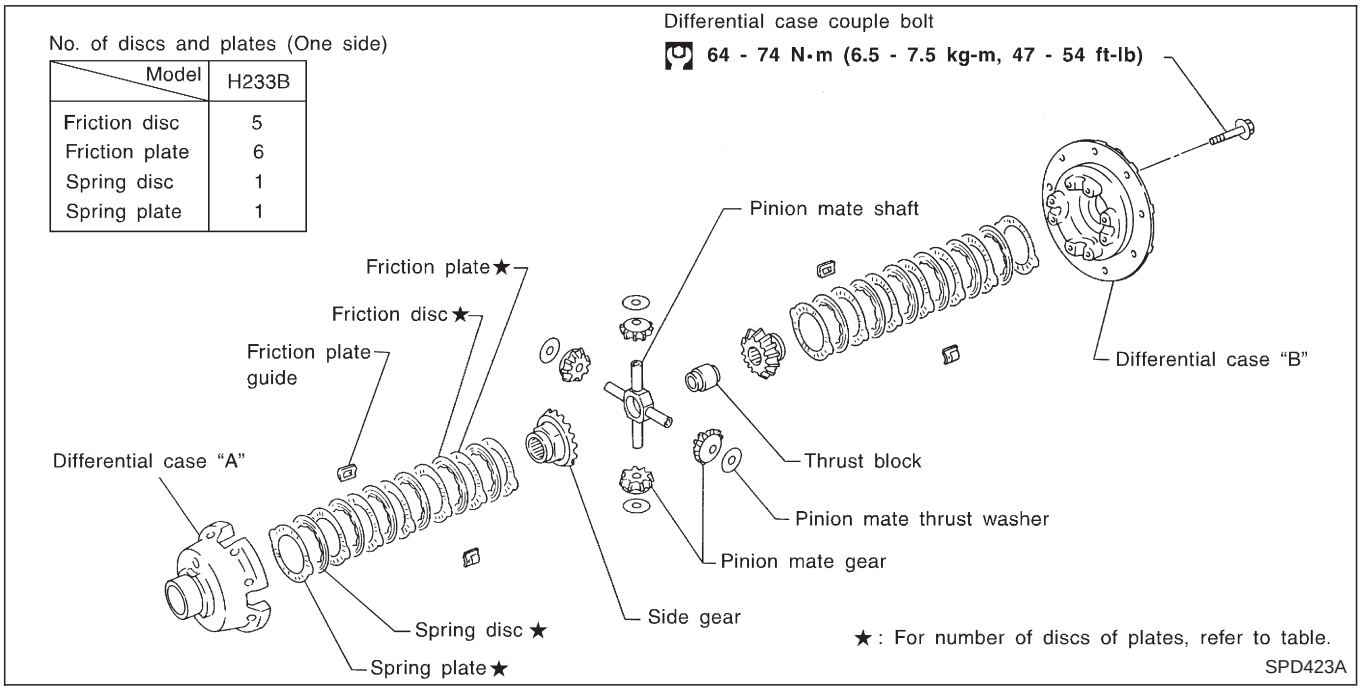
Differential Case Assembly

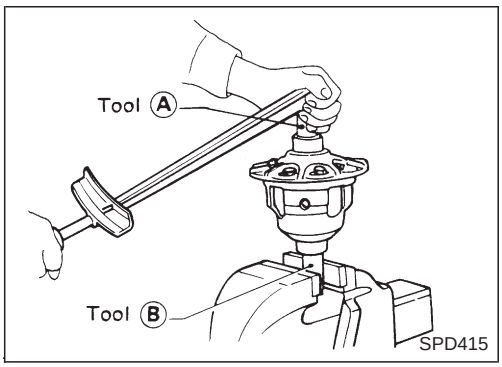
Check mating surfaces of differential case, side gears, pinion mate gears, pinion mate shaft, and thrust washers.



Bearing

1. Thoroughly clean bearing.
2. Check bearings for wear, scratches, pitting or flaking.
   Check tapered roller bearing for smooth rotation. If damaged, replace outer race and inner cone as a set.





CAUTION:
Do not run engine when only one wheel (rear) is off the ground.

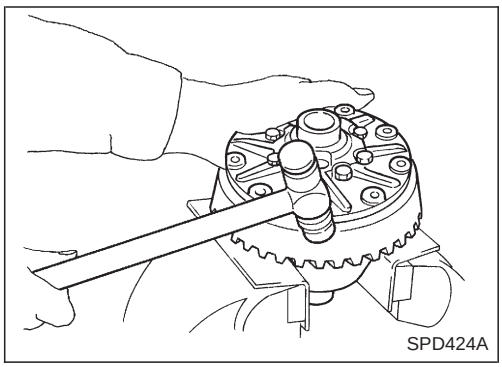
Preparation for Disassembly

CHECKING DIFFERENTIAL TORQUE

Measure differential torque with Tools.
If it is not within the specifications, inspect components of limited slip differential.

Differential torque:
201 - 240 N·m
(20.5 - 24.5 kg-m, 148 - 177 ft-lb)

Tool numbers:
Ⓐ **KV38105210**
Ⓑ **KV38105220**

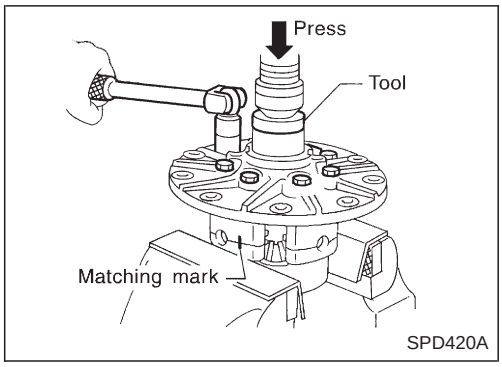


Disassembly

1. Remove side bearing inner cone with Tool.
2. Loosen ring gear bolts in a criss-cross fashion.
3. Tap ring gear off gear case with a soft hammer.

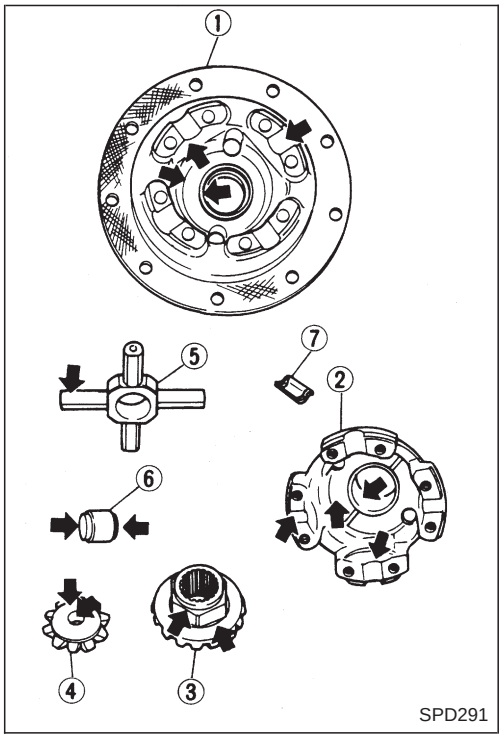
Tap evenly all around to keep ring gear from binding.

Disassembly (Cont'd)



4. Remove couple bolts on differential cases A and B with a press.
   Tool number: ST33081000
5. Separate differential cases A and B.
   Draw out component parts (discs and plates, etc.).

Put marks on differential cases so that they can be reinstalled in their original positions.



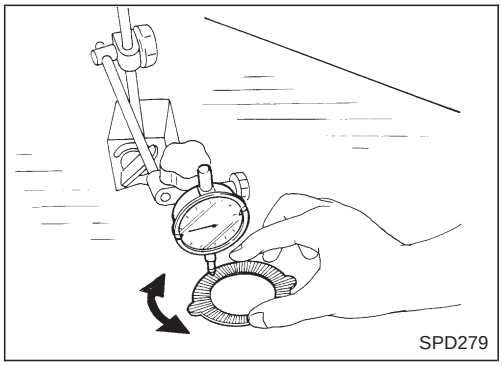
Inspection

CONTACT SURFACES

1. Clean the disassembled parts in suitable solvent and blow dry with compressed air.
2. If the following surfaces are found with burrs or scratches, smooth with oil stone.
   ① Differential case B
   ② Differential case A
   ③ Side gear
   ④ Pinion mate gear
   ⑤ Pinion mate shaft
   ⑥ Thrust block
   ⑦ Friction plate guide

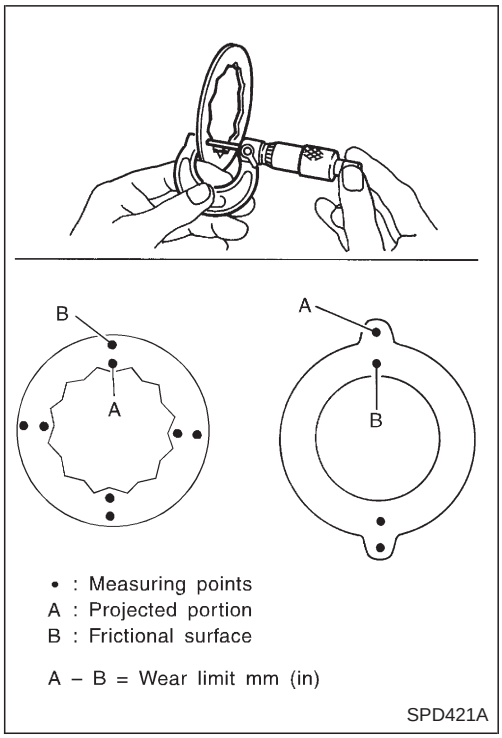
DISC AND PLATE

1. Clean the discs and plates in suitable solvent and blow dry with compressed air.
2. Inspect discs and plates for wear, nicks and burrs.

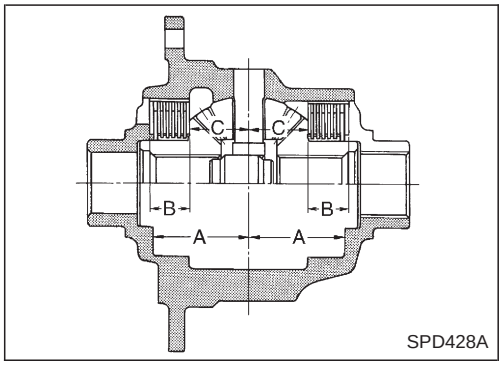


3. Check friction discs or plates for warpage.
   Allowable warpage:
   0.08 mm (0.0031 in)
   If it exceeds limits, replace with a new disc or plate to eliminate possibility of clutch slippage or sticking.

Inspection (Cont'd)



4. Measure frictional surfaces and projected portions of friction discs, plates, spring disc and plate.
   If any part has worn beyond the wear limit, replace it with a new one that is the same thickness as the projected portion.
   Wear limit:
   0.1 mm (0.004 in) or less



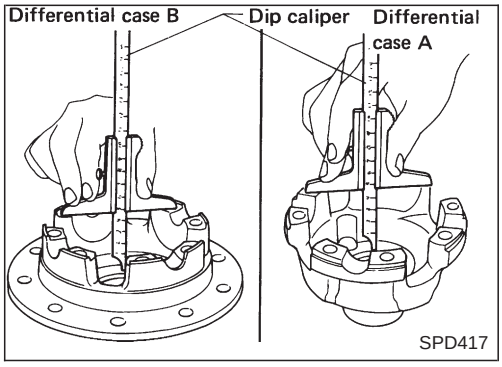
Adjustment

FRICTION DISC AND FRICTION PLATE END PLAY

End play of friction disc and friction plate can be calculated by using the following equation and should be adjusted within the following range.
Adjustment can be made by selecting friction disc having two different thicknesses.

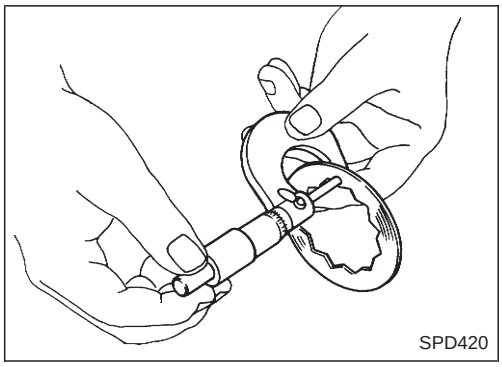
End play E:
0.05 - 0.15 mm (0.0020 - 0.0059 in)
E = A − (B + C)

A: Length of differential case contact surface to differential case inner bottom.
B: Total thickness of friction discs, friction plates, spring disc and spring plate in differential case on one side.
C: Length of differential case contact surface to back side of side gear.

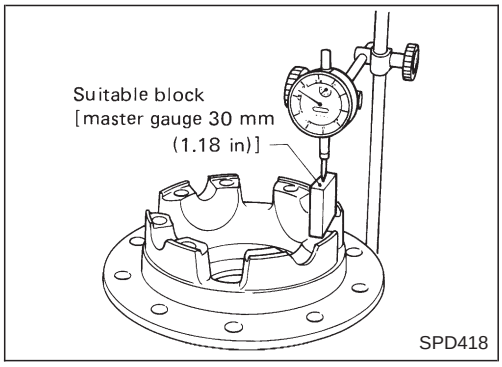


1. Measure values of ''A''.
   Standard length A:
   49.50 - 49.55 mm (1.9488 - 1.9508 in)

Adjustment (Cont'd)


SPD420

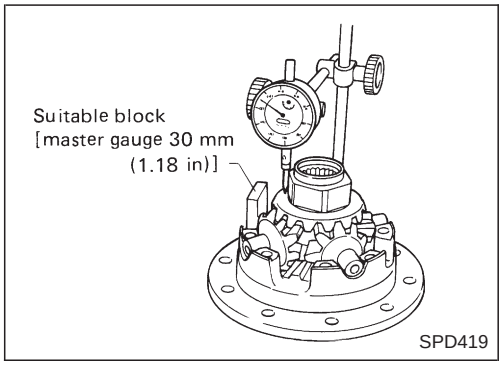
2. Measure thickness of each disc and plate.
   Total thickness "B":
   19.24 - 20.26 mm (0.7575 - 0.7976 in)
   No. of discs and plates (One side):
   Friction disc 5
   Friction plate 6
   Spring disc 1
   Spring plate 1



SPD418

3. Measure values of "C".
a. Attach a dial indicator to the base plate.
b. Place differential case B on the base plate, and install a master gauge on case B.

Then adjust the dial indicator scale to zero with its tip on the master gauge.



SPD419

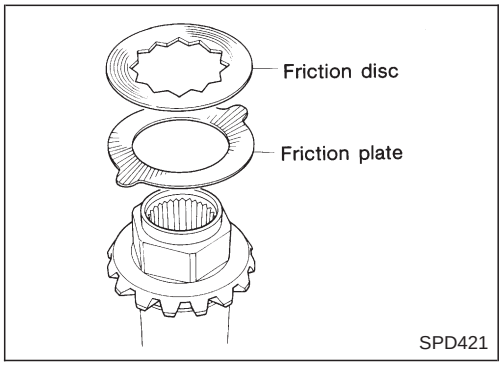
c. Install pinion mate gears, side gears and pinion mate shaft in differential case B.
d. Set dial indicator's tip on the side gear, and read the indication.

Example:

E = A − D = A − (B + C) = 0.05 to 0.15 mm
A = 49.52 mm
B = 19.45 mm
C = 29.7 mm

D = B + C		E = A − D	
B ...	19.45	A ...	49.52
+C ...	29.7	−D ...	49.15
	49.15		0.37

From the above equation, end play of 0.37 mm exceeds the specified range of 0.05 to 0.15 mm.
Select suitable discs and plates to adjust correctly.



SPD421

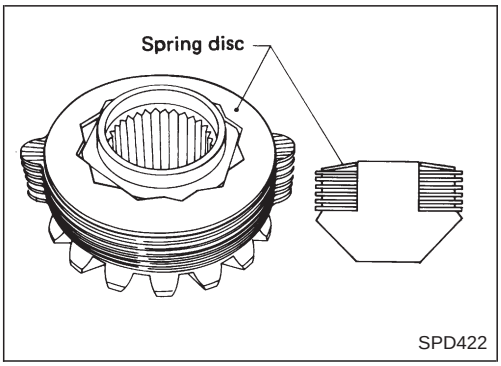
Assembly

Prior to assembling discs and plates, properly lubricate them by dipping them in limited slip differential oil.

1. Alternately position specified number of friction plates and friction discs on rear of side gear.

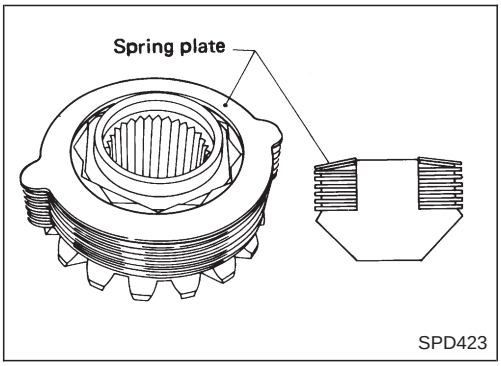
Always position a friction plate first on rear of side gear.

Assembly (Cont'd)

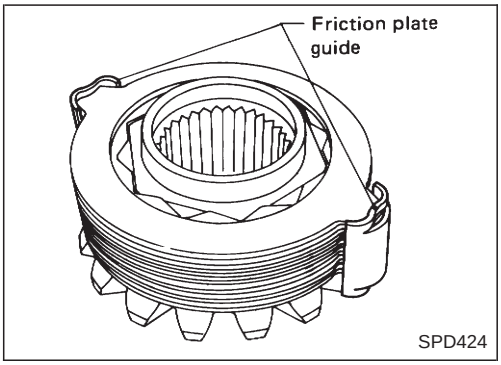


2. Install spring disc.

Align the twelve angular holes in spring disc with the hexagonal area of the side gear.

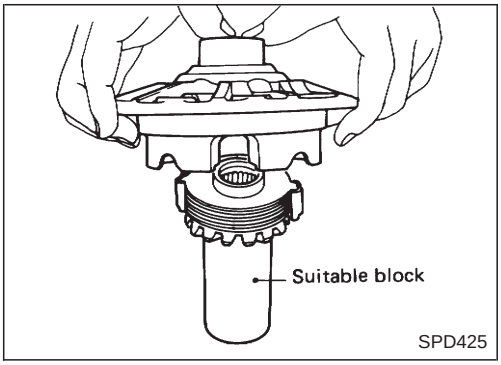


3. Install spring plate.



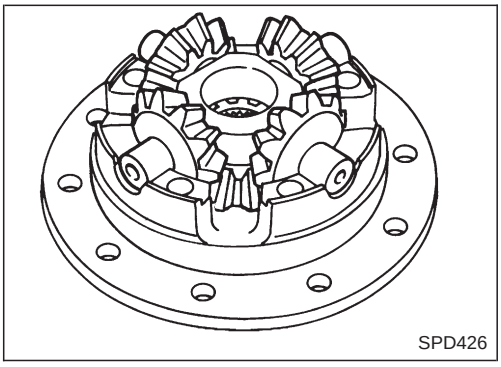
4. Install friction plate guides.

Correctly align the raised portions of friction plates, and apply grease to inner surfaces of friction plate guides to prevent them from falling.



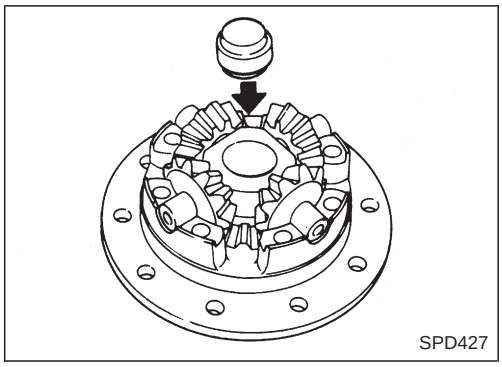
5. Install differential case B over side gear, discs, plates and friction plate guide assembly.

- **Install differential case B while supporting friction plate guides with your middle finger by inserting through oil hole in differential case.**
- **Be careful not to detach spring disc from the hexagonal part of the side gear.**

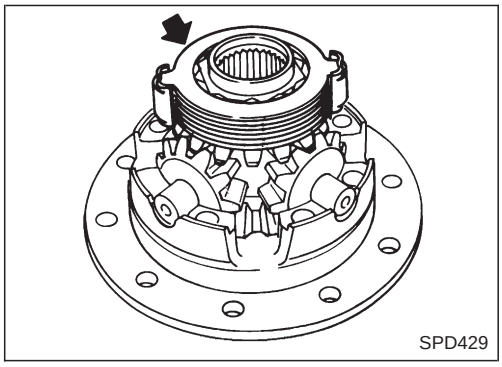


6. Install pinion mate gears and pinion shaft to differential case B.

Assembly (Cont'd)

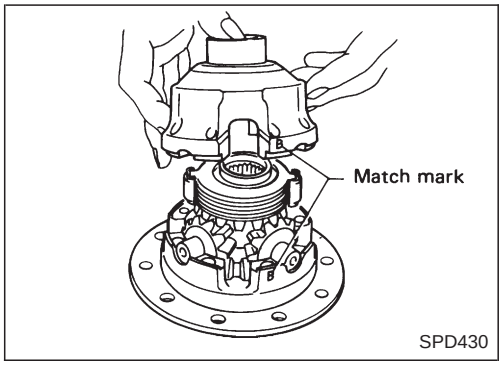

SPD427

7. Install thrust block.


SPD429

8. Install side gear to pinion mate gears.
9. Install each disc and plate.

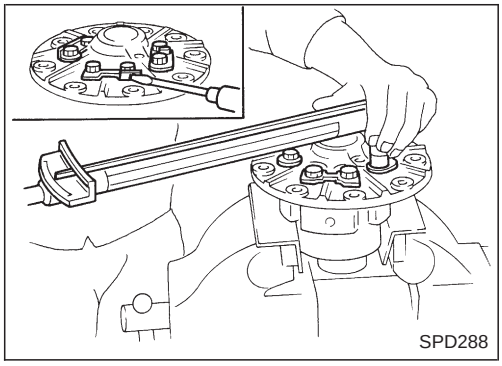
Use same procedures as outlined in steps 1. through 4.



SPD430

10. Install differential case A.

Position differential cases A and B by correctly aligning marks stamped on cases.


SPD288

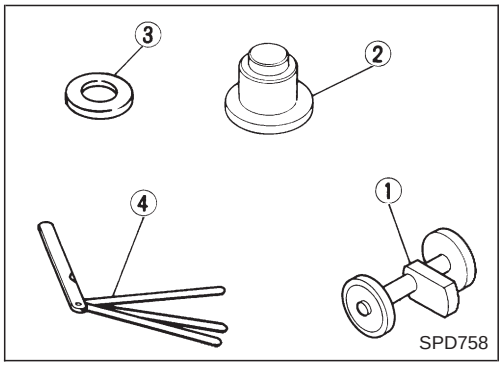
11. Tighten differential case bolts.
12. Place ring gear on differential case and install new lock straps and bolts.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

Then bend up lock straps to lock the bolts in place.

13. Install side bearing inner cone.
14. Check differential torque.

For quiet and reliable final drive operation, the following five adjustments must be made correctly:
1. Side bearing preload
2. Pinion gear height
3. Pinion bearing preload. Refer to ''ASSEMBLY'', PD-73.
4. Ring gear-to-pinion backlash. Refer to ''ASSEMBLY'', PD-74.
5. Ring and pinion gear tooth contact pattern



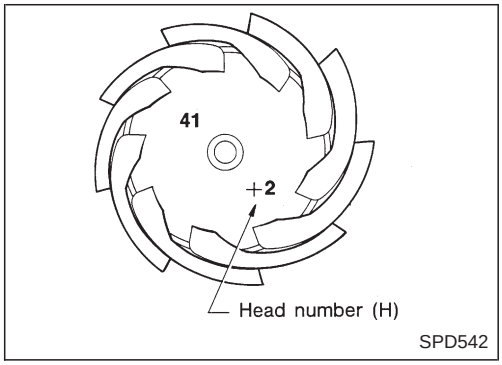
SPD758

Drive Pinion Height

1. First prepare Tools for pinion height adjustment.
   ① Height Gauge (ST31251000)*
   ② Dummy Shaft (ST31181001)*
   ③ Spacer [thickness: 2.00 mm (0.0787 in)] (KV38108700)*
   ④ Feeler Gauge (commercial service tool)
2. To simplify the job, make a chart, like the one below, to organize your calculations.

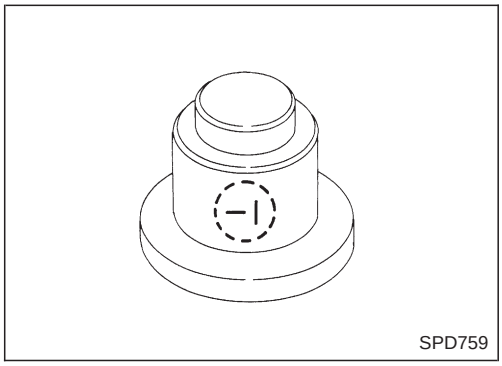
LETTERS	HUNDREDTHS OF A MILLIMETER
H: Head number	
D′: Figure marked on dummy shaft	
S: Figure marked on height gauge	
N: Measuring clearance	

* Set tools are available: ST3125S000 (tools 1 and 2)
ST3125S001 (tools 1, 2 and 3)



SPD542

3. Write the following numbers down in the chart.
   H: Head number

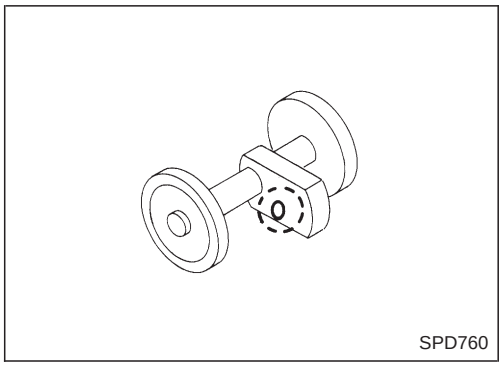


SPD759

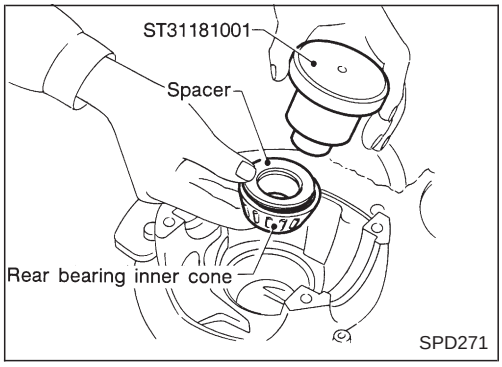
D′: Figure marked on dummy shaft

Drive Pinion Height (Cont'd)

S: Figure marked on height gauge

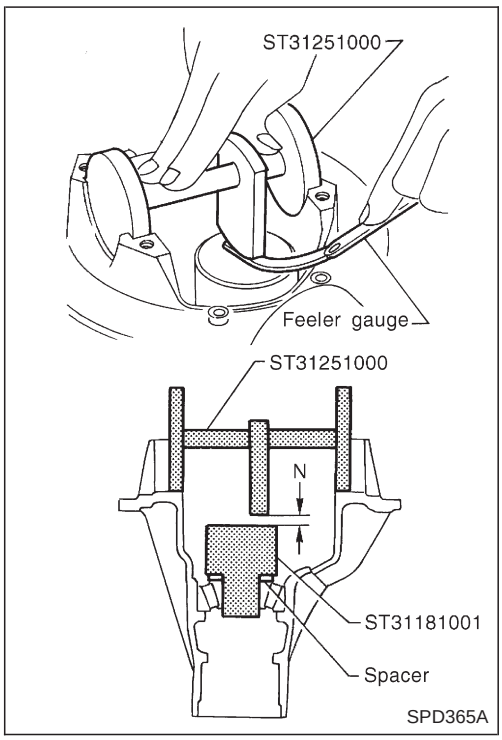

SPD760

4. Place pinion rear bearing inner race and Tools on gear carrier.



SPD271

5. Attach Tool (Height gauge) to gear carrier, and measure the clearance between the height gauge tip and the dummy shaft face.



SPD365A

Drive Pinion Height (Cont'd)

6. Substitute these values into the equation to calculate the thickness of the washer.

If values signifying H, D′ and S are not given, regard them as zero and calculate.

T (Thickness of washer) = N − [(H − D′ − S) x 0.01] + 2.75

Example:

N = 0.40
H = 2
D′ = −1
S = 0

T = N − [(H − D′ − S) x 0.01] + 2.75
= 0.40 − [{2 − (−1) − 0} x 0.01] + 2.75

(1) H 2
−D′ ..... −(−1)
3
−S ..... −0
3

(2) 3
x 0.01
0.03

(3) N 0.40
−0.03
0.37

(4) 0.37
+2.75
3.12

∴T = 3.12

7. Select the proper pinion height washer.

Drive pinion height adjusting washer:
Refer to SDS, PD-80.

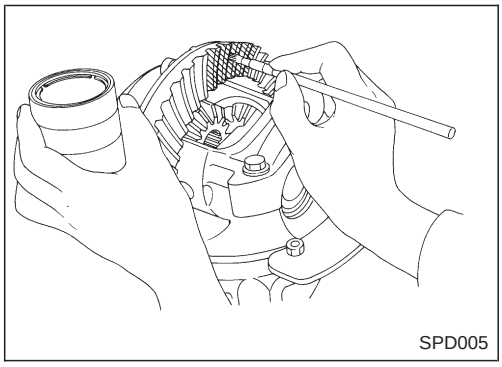
If you cannot find the desired thickness of washer, use washer with thickness closest to the calculated value.

Example:

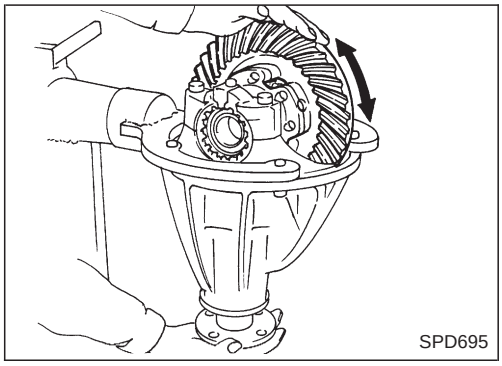
Calculated value ... T = 3.12 mm
Used washer ... T = 3.13 mm

Tooth Contact

Gear tooth contact pattern check is necessary to verify correct relationship between ring gear and drive pinion.
Hypoid gear sets which are not positioned properly may be noisy, or have short life or both. With a pattern check, the most desirable contact for low noise level and long life can be assured.

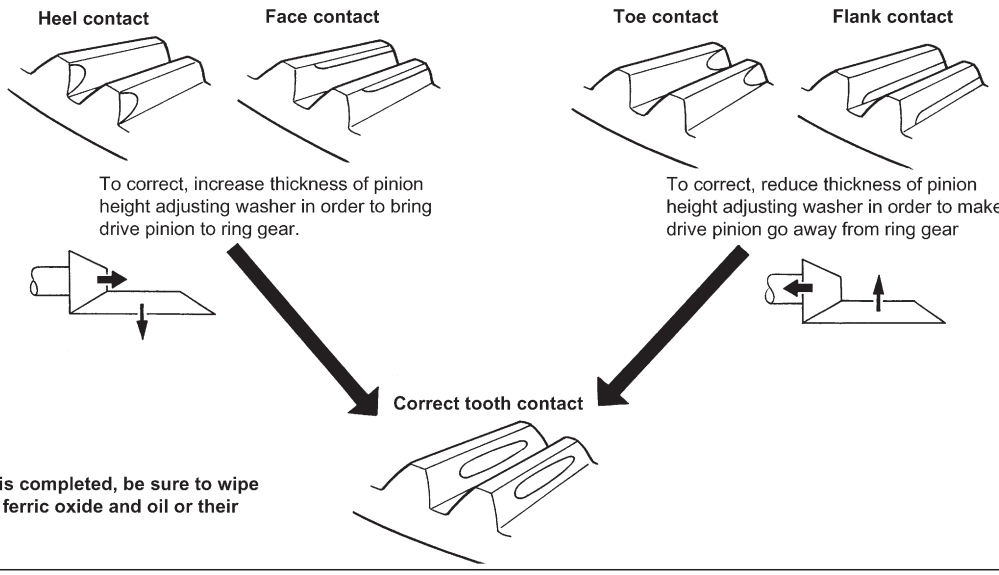

SPD005

1. Thoroughly clean ring gear and drive pinion teeth.
2. Sparingly apply a mixture of powdered ferric oxide and oil or equivalent to 3 or 4 teeth of ring gear drive side.


SPD695

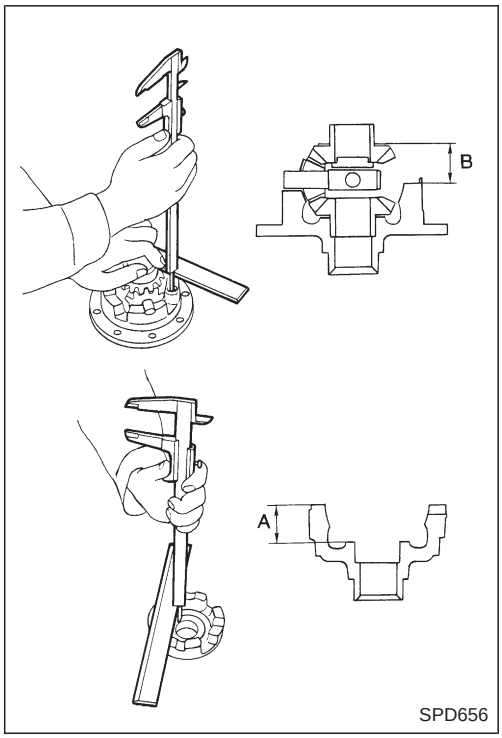
3. Hold companion flange steady and rotate the ring gear in both directions.

Usually the pattern will be correct if you have calculated the shims correctly and the backlash is correct.
However, in rare cases you may have to use trial-and-error processes until you get a good tooth contact pattern.
The tooth pattern is the best indication of how well a differential has been set up.



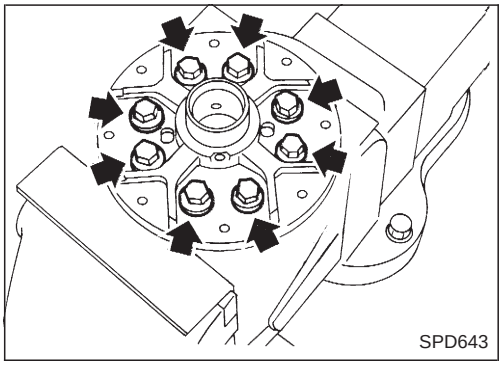
When adjustment is completed, be sure to wipe off completely the ferric oxide and oil or their equivalent.

SPD007

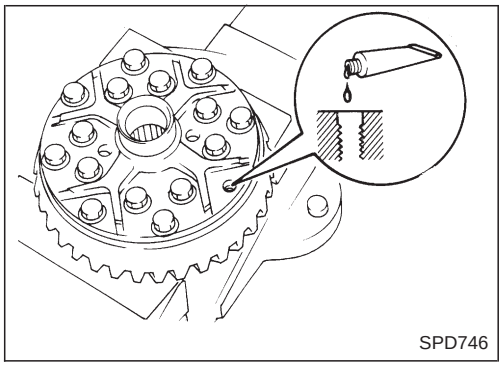


Differential Case

1. Measure clearance between side gear thrust washer and differential case.
   Clearance between side gear thrust washer and differential case (A − B):
   Less than 0.15 mm (0.0059 in)
   The clearance can be adjusted with side gear thrust washer. Refer to SDS, PD-80.
2. Apply gear oil to gear tooth surfaces and thrust surfaces and check to see they turn properly.

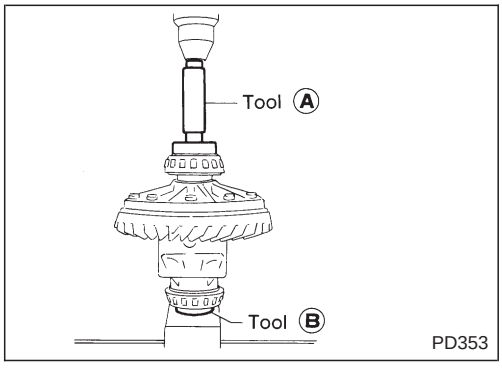


3. Install differential case LH and RH.
4. Install differential case on ring gear.

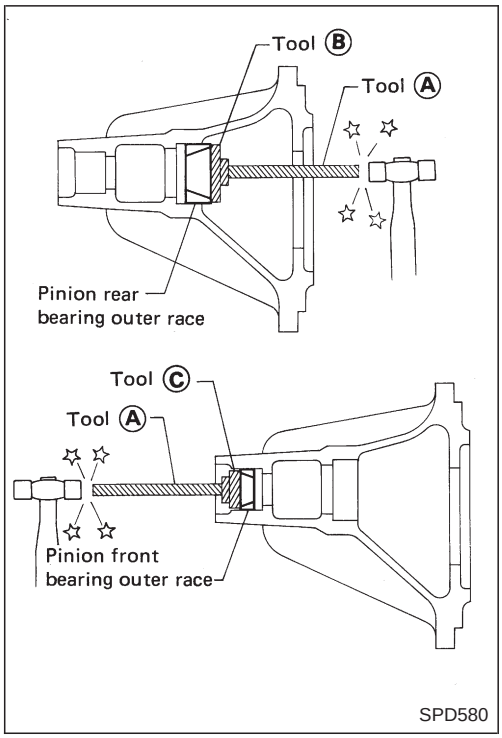


5. Place differential case on ring gear.
6. Apply locking agent [Locktite (stud lock) or equivalent] to ring gear bolts, and install them.

Tighten bolts in a criss-cross fashion, lightly tapping bolt head with a hammer.

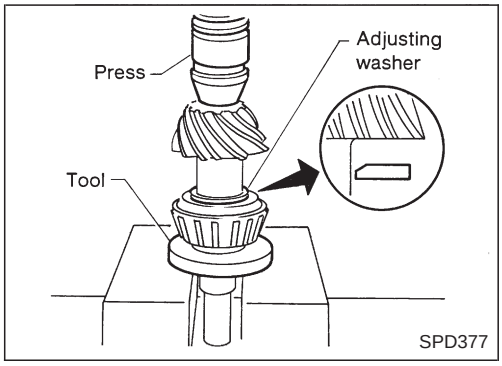


7. Press-fit side bearing inner cones on differential case with Tool.
   Tool numbers:
   (A) ST33190000
   (B) ST33081000

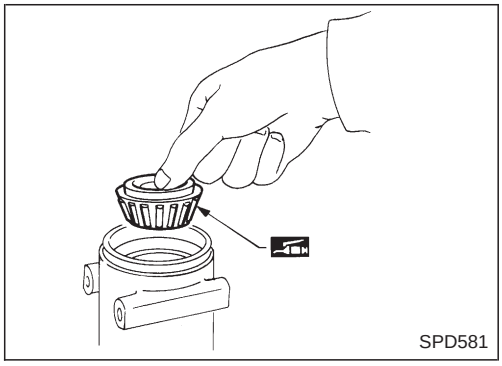


Differential Carrier

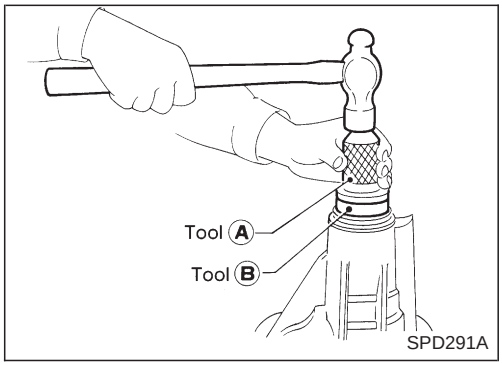
1. Press-fit front and rear bearing outer races with Tools.
   Tool numbers:
   - (A) **ST30611000**
   - (B) **ST30621000**
   - (C) **ST30613000**



2. Select drive pinion height adjusting washer. Refer to ‘‘ADJUSTMENT’’, PD-67.
3. Install drive pinion adjusting washer in drive pinion, and press-fit pinion rear bearing inner cone in it, with press and Tool.
   Tool number: ST30901000

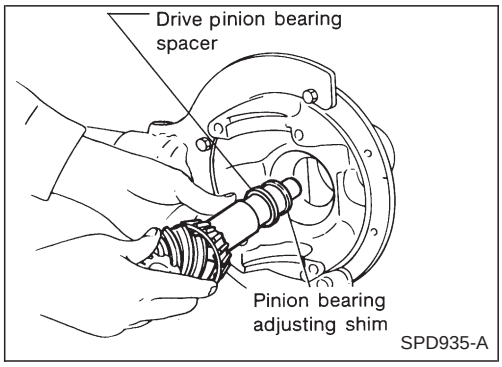


4. Place pinion front bearing inner cone in gear carrier.

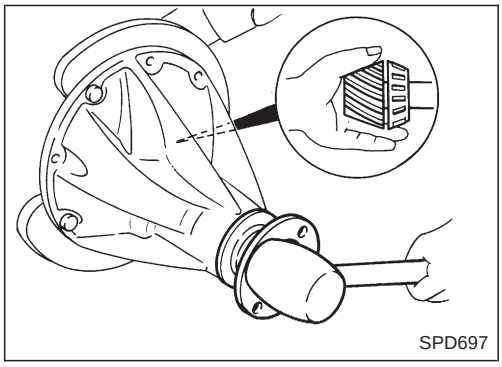


5. Apply multi-purpose grease to cavity at sealing lips of oil seal. Install front oil seal.
   Tool numbers:
   - (A) **ST15310000**
   - (B) **KV40104710**

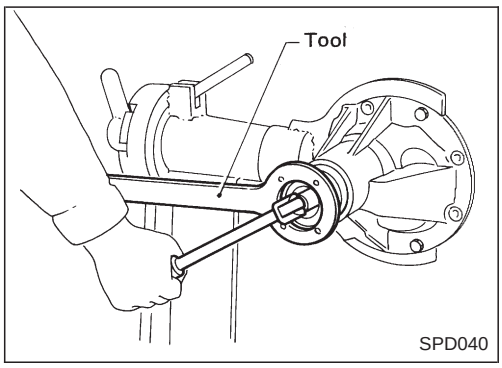
Differential Carrier (Cont'd)



6. Install drive pinion bearing spacer, pinion bearing adjusting shim and drive pinion in gear carrier.



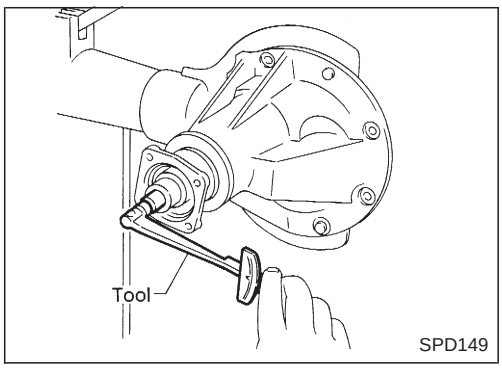
7. Insert companion flange into drive pinion by tapping the companion flange with a soft hammer.



8. Tighten pinion nut to the specified torque.

The threaded portion of drive pinion and pinion nut should be free from oil or grease.

Tool number: KV38104700



9. Turn drive pinion in both directions several times, and measure pinion bearing preload.

Tool number: ST3127S000

Pinion bearing preload (With front oil seal):

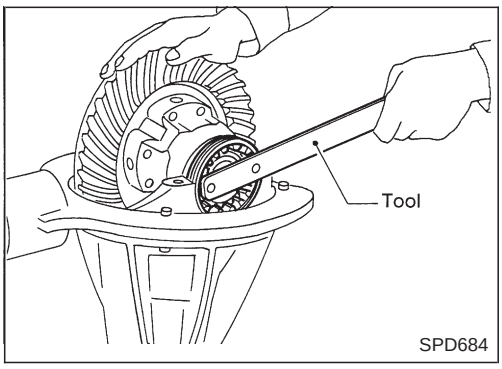
1.4 - 1.7 N·m (14 - 17 kg-cm, 12 - 15 in-lb)

Pinion bearing preload (Without front oil seal):

1.2 - 1.5 N·m (12 - 15 kg-cm, 10 - 13 in-lb)

If preload is out of specification, adjust the thickness of spacer and shim combination by replacing shim and spacer with thinner one.

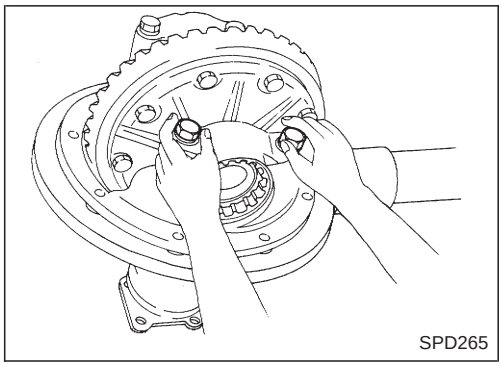
- Start from the combination of thickest spacer and shim.
- Combine each spacer and shim thickness one by one until the correct specification is achieved.



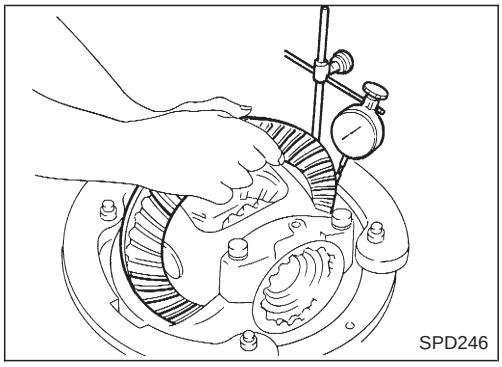
10. Install differential case assembly with side bearing outer races into gear carrier.
11. Position side bearing adjusters on gear carrier with threads properly engaged; screw in adjusters lightly at this stage of assembly.

Tool number: ST32580000

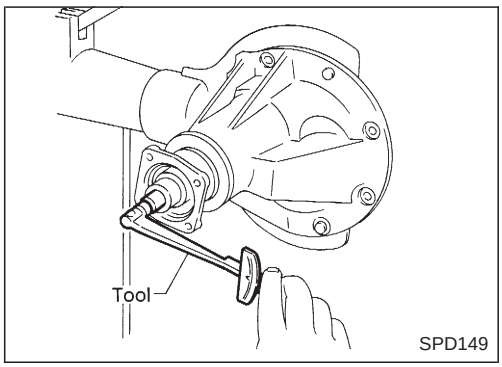
Differential Carrier (Cont'd)


SPD265

12. Align mark on bearing cap with that on gear carrier and install bearing cap on gear carrier.
- Do not tighten at this point to allow further tightening of side bearing adjusters.

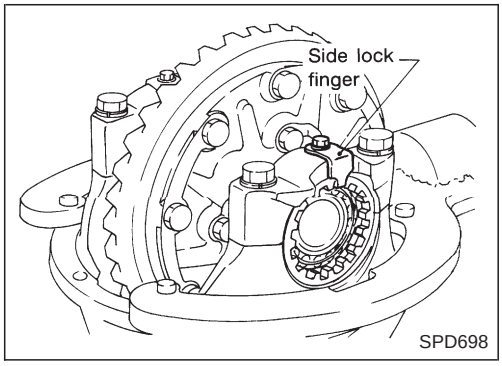

SPD246

13. Tighten both right and left side bearing adjusters alternately and measure ring gear backlash and total preload at the same time. Adjust right and left side bearing adjusters by tightening them alternately so that proper ring gear backlash and total preload can be obtained.
Ring gear-to-drive pinion backlash:
0.13 - 0.18 mm (0.0051 - 0.0071 in)



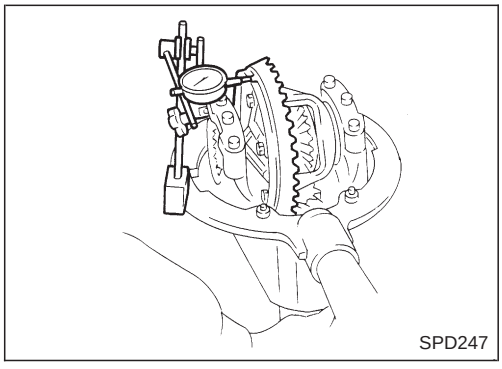
SPD149

- **When checking preload, turn drive pinion in both directions several times to set bearing rollers.**
Tool number: ST3127S000
Total preload (With front oil seal):
Drive pinion bearing
New: 1.5 - 1.7 N·m (15 - 17 kg-cm, 13 - 15 in-lb)
Old: 1.7 - 2.5 N·m (17 - 25 kg-cm, 15 - 22 in-lb)



SPD698

14. Tighten side bearing cap bolts.
15. Install side lock finger in place to prevent rotation during operation.


SPD247

16. Check runout of ring gear with a dial indicator.
Runout limit: 0.08 mm (0.0031 in)
- If backlash varies excessively in different places, the variance may have resulted from foreign matter caught between the ring gear and the differential case.
- If the backlash varies greatly when the runout of the ring gear is within a specified range, the hypoid gear set or differential case should be replaced.
17. Check tooth contact. Refer to ''ADJUSTMENT'', PD-70.

Propeller Shaft

GENERAL SPECIFICATIONS

2WD models

Applied model		Short body		Long body	
		Without ABS	With ABS	Without ABS	With ABS
Propeller shaft model		3S71H			
Number of joints		3			
Coupling method with transmission		Sleeve type			
Types of journal bearings		Solid type (disassembly type)			
Shaft length (Spider to spider) mm (in)	1st	665 (26.18)		641 (25.24)	
	2nd	680 (26.77)	654 (25.75)	1,004 (39.53)	978 (38.50)
Shaft outer diameter mm (in)	1st	75 (2.95)			
	2nd	65 (2.56)			

4WD models

Location		Front	Rear
Applied model		KA24	KA24
Propeller shaft model		2F63H	3S71H
Number of joints		2	3
Coupling method with transmission		Flange type	Sleeve type
Types of journal bearings		Solid type (disassembly type)	
Shaft length (Spider to spider) mm (in)	1st	546 (21.50)	396 (15.59)
	2nd	—	866 (34.09)
Shaft outer diameter mm (in)	1st	63.5 (2.500)	75.0 (2.953)
	2nd	—	65.0 (2.559)

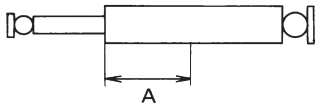
Propeller Shaft (Cont'd)

INSPECTION AND ADJUSTMENT

Front propeller shaft

Unit: mm (in)

Propeller shaft model	2F63H	2F71H
		KA24
Journal axial play limit	0.02 (0.0008)	
Propeller shaft runout limit	0.6 (0.024)	
Measuring point A	136.5 (5.37)	126 (4.96)

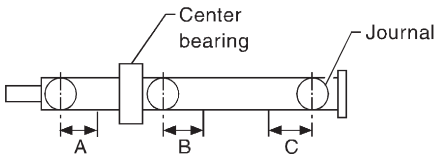


SPD996

Rear propeller shaft

Unit: mm (in)

Propeller shaft model	3S71H	3S80B
Journal axial play limit	0.02 (0.0008)	
Propeller shaft runout limit	0.6 (0.024)	
Measuring point		
A	162 (6.38)	
B	172 (6.77)	
C	192 (7.56)	



SPD418A

Available snap rings

71H models

Thickness mm (in)	ID color	Part number
1.99 (0.0783)	White	37146-01G00
2.02 (0.0795)	Yellow	37147-01G00
2.05 (0.0807)	Red	37148-01G00
2.08 (0.0819)	Green	37149-01G00
2.11 (0.0831)	Blue	37150-01G00
2.14 (0.0843)	Light brown	37151-01G00
2.17 (0.0854)	Pink	37152-01G00
2.20 (0.0866)	No paint	37153-01G00

80B models

Thickness mm (in)	ID color	Part number
1.99 (0.0783)	White	37146-C9400
2.02 (0.0795)	Yellow	37147-C9400
2.05 (0.0807)	Red	37148-C9400
2.08 (0.0819)	Green	37149-C9400
2.11 (0.0831)	Blue	37150-C9400
2.14 (0.0843)	Light brown	37151-C9400
2.17 (0.0854)	Black	37152-C9400
2.20 (0.0866)	No paint	37153-C9400

Final Drive

GENERAL SPECIFICATIONS

2WD models

Applied model		TD25		KA24E	
Final drive model		Standard	Optional	Standard	Optional
		C200			
		2-pinion	LSD	2-pinion	LSD
Oil capacity (Approx.)	ℓ (Imp pt)	1.3 (2-1/4)			
Gear ratio		4.375		3.900	
Number of teeth	Ring gear	35		39	
	Drive pinion	8		10	

4WD models

Applied model		KA24E	
Front final drive		R180A	
		4-pinion	
Oil capacity (Approx.)	ℓ (Imp pt)	1.3 (2-1/4)	
Rear final drive		Standard	Optional
		C200	
		4-pinion	LSD
Oil capacity (Approx.)	ℓ (Imp pt)	1.3 (2-1/4)	
Gear ratio		4.625	
Number of teeth	Ring gear	37	
	Drive pinion	8	

Final Drive (Cont'd)

INSPECTION AND ADJUSTMENT (R180A)

Ring gear runout

Ring gear runout limit mm (in)	0.05 (0.0020)

Axle bearing adjustment

Axle bearing end play mm (in)	0 - 0.1 (0 - 0.004)

Available axle bearing adjusting shims

Thickness mm (in)	Part number
0.10 (0.0039)	38233-01G11
0.20 (0.0079)	38233-01G12
0.30 (0.0118)	38233-01G13
0.40 (0.0157)	38233-01G14

Side gear adjustment

Side gear backlash (Clearance between side gear and differential case) mm (in)	Less than 0.15 (0.0059)

Available side gear thrust washers

Thickness mm (in)	Part number
0.75 (0.0295)	38424-W2010
0.78 (0.0307)	38424-W2011
0.81 (0.0319)	38424-W2012
0.84 (0.0331)	38424-W2013
0.87 (0.0343)	38424-W2014
0.90 (0.0354)	38424-W2015
0.93 (0.0366)	38424-W2016
0.96 (0.0378)	38424-W2017

Side bearing adjustment

Differential carrier assembly turning resistance N (kg, lb)	34.3 - 39.2 (3.5 - 4.0, 7.7 - 8.8)
Side bearing adjusting method	Adjusting shim

Available side retainer shims

Thickness mm (in)	Part number
0.20 (0.0079)	38453-01G00
0.25 (0.0098)	38453-01G01
0.30 (0.0118)	38453-01G02
0.40 (0.0157)	38453-01G03
0.50 (0.0197)	38453-01G04

Total preload adjustment

Total preload N·m (kg-cm, in-lb)	1.2 - 2.3 (12 - 23, 10 - 20)
Ring gear backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

Drive pinion height adjustment

Available pinion height adjusting washers

Thickness mm (in)	Part number
3.09 (0.1217)	38154-P6017
3.12 (0.1228)	38154-P6018
3.15 (0.1240)	38154-P6019
3.18 (0.1252)	38154-P6020
3.21 (0.1264)	38154-P6021
3.24 (0.1276)	38154-P6022
3.27 (0.1287)	38154-P6023
3.30 (0.1299)	38154-P6024
3.33 (0.1311)	38154-P6025
3.36 (0.1323)	38154-P6026
3.39 (0.1335)	38154-P6027
3.42 (0.1346)	38154-P6028
3.45 (0.1358)	38154-P6029
3.48 (0.1370)	38154-P6030
3.51 (0.1382)	38154-P6031
3.54 (0.1394)	38154-P6032
3.57 (0.1406)	38154-P6033
3.60 (0.1417)	38154-P6034
3.63 (0.1429)	38154-P6035
3.66 (0.1441)	38154-P6036

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Adjusting washer and spacer
Drive pinion preload N·m (kg-cm, in-lb)	
With front oil seal	1.1 - 1.7 (11 - 17, 9.5 - 14.8)
Without front oil seal	1.0 - 1.6 (10 - 16, 8.7 - 13.9)

Available drive pinion bearing preload adjusting washers

Thickness mm (in)	Part number
6.58 - 6.60 (0.2591 - 0.2598)	38127-01G00
6.56 - 6.58 (0.2583 - 0.2591)	38127-01G01
6.54 - 6.56 (0.2575 - 0.2583)	38127-01G02
6.52 - 6.54 (0.2567 - 0.2575)	38127-01G03
6.50 - 6.52 (0.2559 - 0.2567)	38127-01G04
6.48 - 6.50 (0.2551 - 0.2559)	38127-01G05
6.46 - 6.48 (0.2543 - 0.2551)	38127-01G06
6.44 - 6.46 (0.2535 - 0.2543)	38127-01G07
6.42 - 6.44 (0.2528 - 0.2535)	38127-01G08
6.40 - 6.42 (0.2520 - 0.2528)	38127-01G09
6.38 - 6.40 (0.2512 - 0.2520)	38127-01G10
6.36 - 6.38 (0.2504 - 0.2512)	38127-01G11
6.34 - 6.36 (0.2496 - 0.2504)	38127-01G12
6.32 - 6.34 (0.2488 - 0.2496)	38127-01G13
6.30 - 6.32 (0.2480 - 0.2488)	38127-01G14

Available drive pinion bearing preload adjusting spacers

Length mm (in)	Part number
52.20 (2.0551)	38130-78500
52.40 (2.0630)	38131-78500
52.60 (2.0709)	38132-78500
52.80 (2.0787)	38133-78500
53.00 (2.0866)	38134-78500
53.20 (2.0945)	38135-78500

Final Drive (Cont'd)

INSPECTION AND ADJUSTMENT (C200)

Ring gear runout

Ring gear runout limit mm (in)	0.05 (0.0020)

Side gear adjustment (without LSD)

Side gear backlash (Clearance between side gear and differential case) mm (in)	Less than 0.15 (0.0059)

Available side gear thrust washers (2WD)

Thickness mm (in)	Part number
0.75 (0.0295)	38424-N3110
0.78 (0.0307)	38424-N3111
0.81 (0.0319)	38424-N3112
0.84 (0.0331)	38424-N3113
0.87 (0.0343)	38424-N3114
0.90 (0.0354)	38424-N3115
0.93 (0.0366)	38424-N3116

Available side gear thrust washers (4WD)

Thickness mm (in)	Part number
0.75 (0.0295)	38424-E3000
0.80 (0.0315)	38424-E3001
0.85 (0.0335)	38424-E3002
0.90 (0.0354)	38424-E3003

Side bearing adjustment

Differential carrier assembly turning resistance N (kg, lb)	34.3 - 39.2 (3.5 - 4.0, 7.7 - 8.8)

Available side bearing adjusting washers

Thickness mm (in)	Part number
2.00 (0.0787)	38453-N3100
2.05 (0.0807)	38453-N3101
2.10 (0.0827)	38453-N3102
2.15 (0.0846)	38453-N3103
2.20 (0.0866)	38453-N3104
2.25 (0.0886)	38453-N3105
2.30 (0.0906)	38453-N3106
2.35 (0.0925)	38453-N3107
2.40 (0.0945)	38453-N3108
2.45 (0.0965)	38453-N3109
2.50 (0.0984)	38453-N3110
2.55 (0.1004)	38453-N3111
2.60 (0.1024)	38453-N3112

Drive pinion height adjustment

Available pinion height adjusting washers

Thickness mm (in)	Part number
3.09 (0.1217)	38154-P6017
3.12 (0.1228)	38154-P6018
3.15 (0.1240)	38154-P6019
3.18 (0.1252)	38154-P6020
3.21 (0.1264)	38154-P6021
3.24 (0.1276)	38154-P6022
3.27 (0.1287)	38154-P6023
3.30 (0.1299)	38154-P6024
3.33 (0.1311)	38154-P6025
3.36 (0.1323)	38154-P6026
3.39 (0.1335)	38154-P6027
3.42 (0.1346)	38154-P6028
3.45 (0.1358)	38154-P6029
3.48 (0.1370)	38154-P6030
3.51 (0.1382)	38154-P6031
3.54 (0.1394)	38154-P6032
3.57 (0.1406)	38154-P6033
3.60 (0.1417)	38154-P6034
3.63 (0.1429)	38154-P6035
3.66 (0.1441)	38154-P6036

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Collapsible spacer
Drive pinion preload N·m (kg-cm, in-lb)	
With front oil seal	1.1 - 1.7 (11 - 17, 9.5 - 14.8)
Without front oil seal	1.0 - 1.6 (10 - 16, 8.7 - 13.9)

Total preload adjustment

Total preload N·m (kg-cm, in-lb)	1.2 - 2.3 (12 - 23, 10 - 20)
Ring gear backlash mm (in)	0.13 - 0.18 (0.0051 - 0.0071)

— Additional service for LSD model —

Differential torque adjustment

Differential torque N·m (kg-m, ft-lb)	88 - 108 (9.0 - 11.0, 65 - 80)
Number of discs and plates	
Friction disc	12
Friction plate	12
Spring plate	2
Wear limit of plate and disc mm (in)	0.1 (0.004)
Allowable warpage of friction disc and plate mm (in)	0.08 (0.0031)
Total thickness mm (in)	19.24 - 20.36 (0.7575 - 0.8016)

Available discs and plates

Part name	Thickness mm (in)	Part number
Friction disc	1.5 (0.059)	38433-C6002 (Standard type)
	1.6 (0.063)	38433-C6003 (Adjusting type)
Friction plate	1.5 (0.059)	38432-C6001
Spring plate	1.5 (0.059)	38435-C6011

Final Drive (Cont'd)

INSPECTION AND ADJUSTMENT (H233B)

Ring gear runout

Ring gear runout limit mm (in)	0.08 (0.0031)

Side gear adjustment (without LSD)

Side gear backlash (Clearance between side gear to differential case) mm (in)	0.1 - 0.2 (0.004 - 0.008)

Available side gear thrust washers

Thickness mm (in)	Part number
1.75 (0.0689)	38424-T5000
1.80 (0.0709)	38424-T5001
1.85 (0.0728)	38424-T5002

— Additional service for LSD model —

Differential torque adjustment

Differential torque N·m (kg-m, ft-lb)	201 - 240 (20.5 - 24.5, 148 - 177)
Number of discs and plates	
Friction disc	10
Friction plate	12
Spring disc	2
Spring plate	2
Wear limit of plate and disc mm (in)	0.1 (0.004)
Allowable warpage of friction disc and plate mm (in)	0.08 (0.0031)
Total thickness mm (in)	19.24 - 20.26 (0.7575 - 0.7976)

Available discs and plates

Part name	Thickness mm (in)	Part number
Friction disc	1.48 - 1.52 (0.0583 - 0.0598)	38433-C6000 (Standard type)
	1.58 - 1.62 (0.0622 - 0.0638)	38433-C6001 (Adjusting type)
Friction plate	1.48 - 1.52 (0.0583 - 0.0598)	38432-C6000
Spring disc	1.48 - 1.52 (0.0583 - 0.0598)	38436-C6000
Spring plate	1.48 - 1.52 (0.0583 - 0.0598)	38435-C6010

Drive pinion height adjustment

Available pinion height adjusting washers

Thickness mm (in)	Part number
2.58 (0.1016)	38151-01J00
2.61 (0.1028)	38151-01J01
2.64 (0.1039)	38151-01J02
2.67 (0.1051)	38151-01J03
2.70 (0.1063)	38151-01J04
2.73 (0.1075)	38151-01J05
2.76 (0.1087)	38151-01J06
2.79 (0.1098)	38151-01J07
2.82 (0.1110)	38151-01J08
2.85 (0.1122)	38151-01J09
2.88 (0.1134)	38151-01J10
2.91 (0.1146)	38151-01J11
2.94 (0.1157)	38151-01J12
2.97 (0.1169)	38151-01J13
3.00 (0.1181)	38151-01J14
3.03 (0.1193)	38151-01J15
3.06 (0.1205)	38151-01J16
3.09 (0.1217)	38151-01J17
3.12 (0.1228)	38151-01J18
3.15 (0.1240)	38151-01J19
3.18 (0.1252)	38151-01J60
3.21 (0.1264)	38151-01J61
3.24 (0.1276)	38151-01J62
3.27 (0.1287)	38151-01J63
3.30 (0.1299)	38151-01J64
3.33 (0.1311)	38151-01J65
3.36 (0.1323)	38151-01J66
3.39 (0.1335)	38151-01J67
3.42 (0.1346)	38151-01J68
3.45 (0.1358)	38151-01J69
3.48 (0.1370)	38151-01J70
3.51 (0.1382)	38151-01J71
3.54 (0.1394)	38151-01J72
3.57 (0.1406)	38151-01J73
3.60 (0.1417)	38151-01J74
3.63 (0.1429)	38151-01J75
3.66 (0.1441)	38151-01J76

Final Drive (Cont'd)

Drive pinion preload adjustment

Drive pinion bearing preload adjusting method	Adjusting shim and spacer
Drive pinion preload N·m (kg-cm, in-lb)	
With front oil seal	1.4 - 1.7 (14 - 17, 12 - 15)
Without front oil seal	1.2 - 1.5 (12 - 15, 10 - 13)

Available drive pinion preload adjusting shims

Thickness mm (in)	Part number
2.31 (0.0909)	38125-82100
2.33 (0.0917)	38126-82100
2.35 (0.0925)	38127-82100
2.37 (0.0933)	38128-82100
2.39 (0.0941)	38129-82100
2.41 (0.0949)	38130-82100
2.43 (0.0957)	38131-82100
2.45 (0.0965)	38132-82100
2.47 (0.0972)	38133-82100
2.49 (0.0980)	38134-82100
2.51 (0.0988)	38135-82100
2.53 (0.0996)	38136-82100
2.55 (0.1004)	38137-82100
2.57 (0.1012)	38138-82100
2.59 (0.1020)	38139-82100

Available drive pinion preload adjusting spacers

Length mm (in)	Part number
4.50 (0.1772)	38165-76000
4.75 (0.1870)	38166-76000
5.00 (0.1969)	38167-76000
5.25 (0.2067)	38166-01J00
5.50 (0.2165)	38166-01J10

Total preload adjustment

Total preload N·m (kg-cm, in-lb) With front oil seal	Drive pinion bearing	New	1.5 - 1.7 (15 - 17, 13 - 15)
		Old	1.7 - 2.5 (17 - 25, 15 - 22)
Ring gear backlash mm (in)			0.13 - 0.18 (0.0051 - 0.0071)
Side bearing adjusting method			Side adjuster